Supreme Court, U. S.
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IN THE

Supreme Court of the United States

October Term, 1973.

No. 73-1893.

BLOHM & VOSS AG,

Petitioner,

v.

PRUDENTIAL-GRACE LINES, INC.,

Respondent.

On Petition for a Writ of Certiorari to the United States Court of Appeals for the Fourth Circuit.

BRIEF FOR RESPONDENT IN OPPOSITION TO PETITION.

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OPINIONS BELOW.

The opinion of the United States Court of Appeals for the Fourth Circuit is reported at 489 F. 2d 231 and is reproduced as Addendum A, *infra*.

The opinion of the United States District Court for the District of Maryland is reported at 346 F. Supp. 1116 and is reproduced as Addendum B, *infra*.

COUNTER-STATEMENT OF QUESTIONS PRESENTED.

1. Whether the fact that an appellate judge went to a public library and thereafter referred in his opinion to standard texts found there by way of a background statement showing the availability of materials reflecting the ancient origins of mechanical principles and devices acknowledged in the record below as old, constituted procedural unfairness to petitioner?

2. Whether the standard of review employed by the Court of Appeals in determining the obviousness of a combination patent was improper where it was conceded that the patent embodied no new elements and where two crucial findings in the district court with respect to the prior art were clearly erroneous?

3. Whether the Court of Appeals correctly apprehended the prior art and correctly determined the obviousness of the patent in suit?

COUNTER-STATEMENT OF THE CASE.

This is a patent infringement action resting on United States Letters Patent 3,236,390 ('390), which covers a type of swing-through cargo gear for installation on ships. The United States District Court for the District of Maryland had held that the patent was valid and, in part, infringed. On appeal, the United States Court of Appeals for the Fourth Circuit held (one judge dissenting) that the patent was invalid pursuant to 35 U. S. C. Section 103 in that ". . . any achievement here was that of mechanical improvement utilizing known elements and known concepts and that such improvement was obvious to one reasonably skilled in the art." 489 F. 2d at 246. The Court of Appeals did not reach the other issues presented for review in that Court.

Patent '390 is a combination patent describing a type of loading and unloading gear, mounted on a ship, which is capable of serving both the fore and aft hatches of vessels without rerigging. *See* 489 F. 2d at 234 n. 3. (sketch). As put by the Court of Appeals, "[s]imply stated, [the] configuration is not unlike the human body . . . ." 489 F. 2d at 235.

In reaching its conclusion, the Court of Appeals carefully examined the pertinent areas of prior art relevant to the ". . . concept of swinging the boom and purchase gear through to serve fore and aft hatches." 489 F. 2d at 238. (The description of the prior art is found at 489 F. 2d 238-242.) Five prior art patents are discussed in the opinion, 1) each of which is also discussed in the district court opinion;[1] 2) each of which appears in the record;[2] and, 3)

1. 346 F. Supp. 1121-28.

2. William B. Ashe, No. 1,257,664 (1918), Plaintiff's Exhibit No. 2 (E1 [all page references beginning with "E" refer to the Exhibit Appendix in the Court of Appeals], 238a [all page references (footnote cont'd)

each of which, contrary to petitioner's statement to this Court that respondent relied *solely* on only one of them (Petition, p. 5), was referred to by respondent in the course of this action.[3] Moreover, various models and pictures and drawings of the prior art patents were presented by both parties to the Court of Appeals during oral argument (all of which were exhibits in the district court or blow-ups of exhibits), and left with the Court of Appeals until the proceedings there had become final.[4]

After reviewing these five prior art patents and the mechanical principles revealed by them, including the fact that the prior art already disclosed swing-through cargo gear capable of serving two hatches,[5] the Court of Appeals then addressed the differences between the claims of the

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2. (Cont'd.)

ending with "a" refer to the Appendix in the Court of Appeals]); Kohnenkamp, et al., No. 2,914,193 (1959), Plaintiff's Exhibit No. 32 (E60, 468a); Lehmann No. 3,042,222 (1962), Plaintiff's Exhibit No. 36 (E76, 493a); Lehmann No. 3,107,790 (1963), Plaintiff's Exhibit No. 34 (E67, 478a); Sparrow No. 3,110,403 (1963), Plaintiff's Exhibit No. 26 (E52, 399a).

3. *See*, for example, the discussion of the prior art in respondent's brief to the Court of Appeals, pp. 5-7, 37. See also E1, E60, E76, E67, E52. Moreover, many other references were utilized to illustrate the development of the art from ancient times.

4. Including, *inter alia*, blow-ups of various figures of William B. Ashe, No. 1,257,664 (1918) [the boat davit] as well as a model of the boat davit device; a blow-up of figure 1 of Kohnenkamp, et al., 2,914,193 (1959); blow-ups of various figures of Lehmann No. 3,042,222 (1962) as well as a model of the device; and a blow-up of figure 3 of Sparrow No. 3,110,403 (1963). If it becomes material, arrangements can be made for transcribing the tape recording made by the Court of Appeals of oral argument in that Court.

5. This fact was never in dispute, as is reflected in the briefs of the petitioner in the District Court and the Court of Appeals, *e.g.*, "Plaintiff's Reply Brief in Respect of Validity and Misuse" in the District Court filed September 1, 1970 at 3; Appellee's Brief in the Court of Appeals at 5. Indeed the prior art patent Kohnenkamp, et al. '193 opens by stating: "This invention relates to ship's loading device having a boom with two hangers which can be swung between two uprights and two independent hangar winches." (E60).

'390 patent and the prior art. 489 F. 2d at 242-43. Relying on this Court's decisions, especially as they apply to a combination patent embodying no new mechanical concept, 489 F. 2d 244-46, the Court of Appeals held that the district court had erred in not finding '390 obvious. 489 F. 2d at 246.

So much of the analysis of the issue before it by the Court of Appeals as has just been set forth is commonplace, and indeed is required in order that a reasoned decision on "obviousness" and thus patent-worthiness may be rendered. The petition here appears, however, to have been evoked by a brief passage in the Court of Appeals opinion immediately preceding the discussion of the immediately relevant prior art references in the swing-through cargo gear area.

Before addressing directly the immediately relevant prior art references, the Court of Appeals devoted several paragraphs and a footnote to a general history of lifting gear, 489 F. 2d at 238, matters as to which there could be no dispute and about which there never was, in fact, any dispute in the proceedings in the district court. The discussion is introduced by the statement, "The basic idea of booms, blocks, lines and winches is, of course, quite old." *Id.* There follows a series of references to "manuals of seamanship and texts crusty with age . . . ."[6] *Id.*

Through a conversation with the secretary of Judge Widener (who wrote the majority opinion), petitioner's counsel "discovered" that these citations to "manuals . . . and texts crusty with age" were gathered by Judge Widener in a visit to the Mariners Museum in Newport

6. *Steel's Elements of Mast Making, Sailing and Rigging,* from the 1794 edition, W & G Foyle, Ltd. London; A British Standards Institution publication (BS 302: 1938, figure 23); *The Notebooks of Leonardo da Vinci,* p. 638 (Edited by MacCurdy, 1954).

News, Virginia. This discovery gave rise to an application by petitioner's counsel to the Chief Judge of the Fourth Circuit, the end result of which is described in a letter from Chief Judge Haynsworth to counsel reprinted in Petitioner's Appendix in this Court at pages 113a-116a. Having in effect accused Judge Widener of unethical conduct and having been rejected in this endeavor by the entire Judicial Conference of the Fourth Circuit, Judge Widener not participating (see Chief Judge Haynsworth's letter), petitioner then filed a petition for a rehearing in the Court of Appeals, which was denied without opinion. The petition to this Court followed.

REASONS FOR DENYING THE PETITION.

I. There Was No Procedural Unfairness to Petitioner Blohm & Voss AG in the Court of Appeals.

It should be noted at the outset that the truth of the statements made by way of historical background in the opinion of the Court of Appeals, 489 F. 2d at 238, has never been contested in this case. In fact, similar statements were made orally by petitioner's counsel in the district court,[7] were made in petitioner's briefs in the district court,[8] and were illustrated by exhibits introduced by peti-

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7. *E.g.*, "MR. CARR: * * *

Now, in the course of our presentation, I will have Mr. Sprengel give you a historical background of cargo gear, beginning with the Egyptians. We have light cargo gear—

THE COURT: They used this in the construction of the pyramids?

MR. CARR: Yes. I believe there is a model of one of these that was used in constructing the pyramids, is one of these models. But we will come to that later. I don't want to usurp defendant's models at this juncture.

And I think I might show Your Honor a few of the pictures from some of the art, just to give you some idea.

This is what is called a pair of shear legs, and defendant has prepared a model for this. This, as you can see, Your Honor, is either putting into or taking out of a hold some cargo or some weight of some kind, and it is a pair of sticks which are supported by guy-wires, and from the center the junctures of them, there are a pair of blocks, one which you can pull a rope and raise the weight out of the hold.

This is another version of it, in which instead of crossing the sticks, they block them up and use a cross post here and hung two, we believe, because this, by using two of them, they can raise twice as much weight. These are very old. I think this publication bears a date of 1942. Its first copyright was in 1901, and I submit to you, it is perhaps a hundred or a hundred and fifty to 200 years old." Appendix in the Court of Appeals at 76a-77a.

8. *E.g.*, "Cargo gear has been used to move cargo to and from ships since antiquity (PX106)." Plaintiff's Reply Brief In Respect of Validity and Misuse at 1 (dated September 1, 1970); "From the time of the Egyptians, apparatus has been installed both on ships and on shore, for moving cargo to or from shipboard. Originally, this apparatus was of a very simple type, not unlike the well-known

(footnote cont'd.)

tioner in the district court along with the testimony by plaintiff's witness tracing the history of these concepts.[9] One of plaintiff's exhibits,[10] which was handed up to the bench of the Court of Appeals during argument by petitioner's counsel, illustrates the antiquity of the origin of various of the elements described in the background material found in the Opinion of the Court of Appeals in a photograph of a painting depicting the waterfront at the port of ancient Antioch, in the year A. D. 250. This exhibit is reproduced opposite page 10 *infra*.

In addition, as is apparent from a reading of the opinion of the Court of Appeals, this background information was not relied on in finding the patent in suit obvious. As the Court stated: "Specific reference to publications is made only to indicate the availability of reference material showing that the age of the components of the patented device far antedates the patent in question, without attempt to accurately date the origin of many of

8. (Cont'd.)

derrick. As the needs of commerce changed, as well as the size of ships, and the weight of cargos increased, better or different apparatus was required to move cargo. The obvious solution was to employ larger gear of greater capacity. The history and nature of such gear will be fully developed for the Court." Plaintiff's Pre-Trial Memorandum at 2-3.

9. Sprengel, the inventor of '390, appearing as a witness below for petitioner Blohm & Voss, was asked to begin his testimony with an explanation for the Court of the history of cargo gear. He began with the Egyptians, making sketches for the Court. Appendix in the Court of Appeals at 272a et seq. The flavor of this testimony can be gleaned from the denomination of Sprengel's sketches in the record: (1) "Plaintiff's Exhibit No. 12 (Thereupon, a Sprengel sketch of an Egyptian barge cargo-handling apparatus was marked in evidence as Plaintiff's Exhibit No. 12.)" Appendix in the Court of Appeals at 277a. (2) "Plaintiff's Exhibit No. 13 (Thereupon, a Sprengel sketch of a standard sailing ship was marked in evidence as Plaintiff's Exhibit No. 13.)" Appendix in the Court of Appeals at 282a.

10. Plaintiff's Exhibit No. 106 (2350a), Pages 816-17 of Vol. 136 No. 6, National Geographic Magazine, December 1969.

the parts which may very well be lost in antiquity." 489 F. 2d at 238n. 11.

In this case the Court did not find any "facts" in these publications that were not of record; it was merely attempting to show the availability of materials reflecting some of the more ancient concepts, evidence of which was introduced by petitioner itself as a starting point for the more recent developments in the area of two hatch cargo gear.[11] This is precisely what was done by the Court of Appeals as it turned its attention ". . . to the more pertinent area of two-hatch gear and the concept of swinging the boom and purchase gear through to serve two hatches." 489 F. 2d at 238.

Petitioner's quarrel with the court below becomes even more difficult to understand because, even as to this more pertinent area, "[i]t is acknowledged that all of the elements are old in the art, and that there is nothing new in the concept of swinging through." 489 F. 2d at 246. Even had it not been explicitly conceded at argument in the Court of Appeals, it is incontestable that devices similar in function to the patent in issue here had been patented prior to '390.[12] It was in this context that the opinion, admirably, gives the reader unfamiliar with such matters, a brief historical background in which to frame the Court's careful analysis of the more recent and more pertinent prior art.

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11. Of course, these elements are embodied in the specific prior art to which the Court of Appeals turned its attention, *e.g.* Kohnenkamp, et al. No. 2,914, 193 (1959), 489 F. 2d at 239-40. This is recognized in the opinion of the district court as well, *e.g.*, 346 F. Supp. at 1121. Plaintiff's Exhibit No. 18, in addition, is a sketch of standard gear prior to 1930 embodying these elements (328a).

12. For example, Sprengel, the inventor of '390 was co-inventor of a similar device patented prior to '390, Kohnenkamp, et al. No. 2,914,193 (1959) (E60, 468a). *See* footnote 5, *supra*. This is apparent from Appellee's Brief in the Court of Appeals at 4-5; from the opinion of the District Court, 346 F. Supp. at 1121; and from the opinion of the Court of Appeals 489 F. 2d at 239-40.

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"On the waterfront: A. D. 250. Muffled staccato of an imminent thunderstorm speeds the pace of wharfside activities at Seleucia Pieria, the port of ancient Antioch—today's Antakya. To create this specially commissioned painting for NATIONAL GEOGRAPHIC, the artist adapted diagrams and photographs of reconstructed ruins and artifacts of a similar port from the same era, Leptis Magna in Libya. Longshoremen lug wine amphorae, right, from a Roman vessel. A servant girl, center, queries the price of clams for her Greek master's table. Vendor, left, hurries with his unplucked wares to the marketplace. Beyond, workmen unload a Corinthian capital; column base and yet-to-be-fluted central section rest on the stone-paved dock. Temple and warehouses flank the harbor, guarded by a watchtower and lighthouse at its entrance. Today, a plain of silt, tilled by Turkish farmers, covers the site of both port and harbor."

(Plaintiff's Exhibit No. 106.) National Geographic Magazine, Vol. 136 No. 6, December 1969 pp. 816-817.

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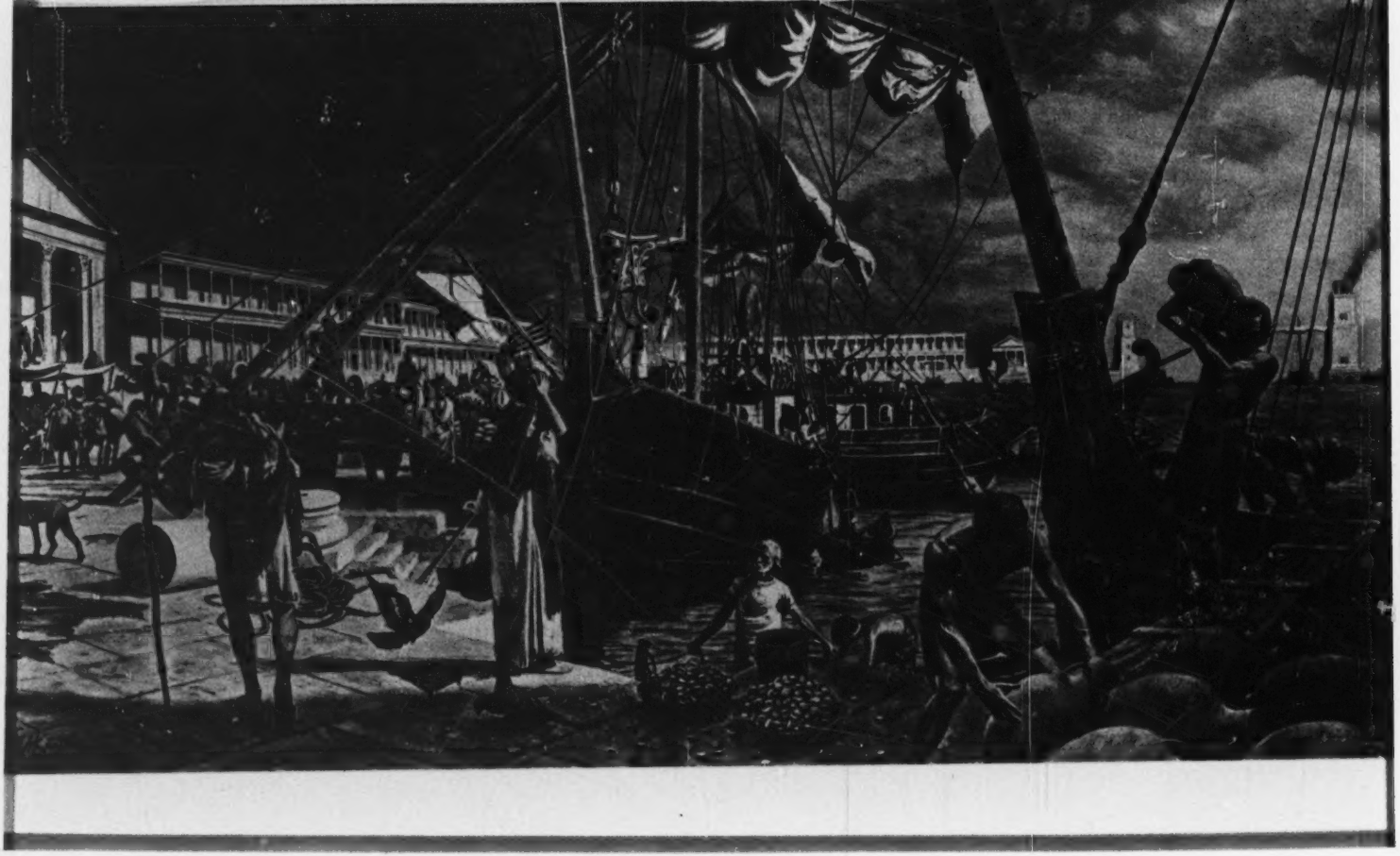

A number of opinions of this Court indicate that Judges (and Justices), just as Judge Widener did here, may properly avail themselves of standard reference works to acquire background information relevant to the issues before the Court. In fact, in some of these opinions, judicial notice appears to have been taken of the content of such works even when—contrary to the situation here—such matters may have been in dispute.

A classic example of the practice in the patent field appears in *Werk v. Parker*, 249 U. S. 130 (1919). There, the patents at issue related to an oil-press mat or cloth of horse hair used in the extraction of cotton-seed oil. The Court of Appeals had ". . . found, from an examination of standard works, that the patentee's use was but a revival of an old and well-recognized use of such mats in the art of oil extraction. Reference was made to the British Encyclopedia, 9th ed., 1884, the Standard Dictionary of 1894, and a multitude of other publications long antedating the application for the patent." 249 U. S. at 132. This Court specifically approved the lower court's research endeavors:

> "It is not questioned that these references abundantly showed that the use of hair cloth, and especially horse-hair cloth, in the making of oil-press mats or cloths, was well known in the art long before the patents in suit.
>
> "Nor is it questioned—indeed, we deem it clear, beyond question—that the court was justified in taking judicial notice of facts that appeared so abundantly from standard works accessible in every considerable library. [citations omitted]
>
> "The burden of petitioner's argument in this court, as in the application for a rehearing in the Circuit

> Court of Appeals, is that there was nothing in these publications to show that the horse-hair cloth so familiar in the art embodied the 'structural characteristics' of the oil-press mats of the patents in suit, referring to the peculiar mode of weaving described in the claims. But at the hearing it was clearly proved, and was conceded to be beyond controversy, that the patents involved no claim of an improvement in the art of weaving, but only the application of that art and a combination of threads of a certain type and character in order to produce a particular result. And this, in our opinion, goes no further than a mere mechanical adaptation of familiar materials and methods, not rising to the dignity of invention." [citations omitted]

249 U. S. at 132-33.

In another patent case, *Concrete Appliances Co. v. Gomery*, 269 U. S. 177 (1925), Mr. Justice Stone, writing for the Court, noted that the patented combination was useful, 269 U. S. at 180, but was nevertheless unable to find more than ". . . mechanical skill in the course of a natural development and expansion of the art." 269 U. S. at 185. This conclusion followed, in part, from judicial notice of historic elements and developments in the mechanical arts involved:

> "It is a fact of which we may take judicial notice [citation omitted] that the principle of conveying and distributing a mobile substance by gravity has found exemplification for centuries, in apparatus for lifting water by power, in buckets or other convenient form of conveyor . . . ."

269 U. S. at 180-81.

In *United States v. Philadelphia National Bank*, 374 U. S. 321 (1963), the Court in discussing the background of commercial banking in the United States stated:

> "The discussion in this portion of the opinion draws upon undisputed evidence of record in the case, *supplemented* by pertinent reference materials."

374 U. S. at 324 n. 2 (emphasis added). There then follows a listing of reference materials occupying more than 30 lines in the United States Reports. *Id.* at 324-325 n. 2.

In this case, where petitioner itself offered evidence showing the origin in antiquity of the elements involved and conceded that antiquity, it borders on the frivolous for petitioner now to criticize the Court below for having briefly examined into that very antiquity. Especially is this true when the background information thus sought and noted in the opinion is *not* relied upon in the subsequent exacting analysis of the more recent prior art of record.

II. There Was No Error in the Standard of Review Utilized by the Court of Appeals in Determining That the Patent in Suit Was Obvious, 35 U. S. C. Section 103.

In the case at bar the Court of Appeals found two crucial district court findings relating to the prior art clearly erroneous. First, "[t]o the extent that such analysis [of the Ashe patent by the district court] was based on the assumption that davits do not raise, lower and transfer, it was clearly erroneous." 489 F. 2d at 239. Second, "[t]he finding of the district court that Lehmann '222 taught a boom which rotates on a 180 degree axis to *face* one hatch and then *turn* to face the other hatch was clearly erroneous. Lehmann '222 instead discloses a boom which is raised and lowered, not rotated, to accommodate

both hatches, precisely in the same manner as Sprengel '390." 489 F. 2d at 240 (emphasis by the Court).

Far from misapplying F. R. Civ. P. 52(a), the Court of Appeals thus applied the precise standard therein set forth.

It is apparent from other portions of the opinion of the Court of Appeals, that that Court did not quibble with the district court's factual findings as to the content of the prior art except when they were clearly wrong. Moreover, it limited its review to those district court determinations which depended upon a correct understanding of mechanical principles and not the demeanor of witnesses. *See United States v. General Motors Corp.*, 384 U. S. 127, 141-42 n. 16 (1966). Its reversal of the district court was based solely on the district court's clear misunderstanding of the teaching of the mechanics of the prior art, reinforced by the conclusion (as a matter of law and not of fact) that the district court had not applied the exacting standard expressed in *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U. S. 57 (1969), and *A & P Tea Co. v. Supermarket Corp.*, 340 U. S. 147 (1950), when faced with a patent resting on nothing but a combination of principles old in the art.

In *Anderson's-Black Rock, Inc. v. Pavement Salvage Co., supra,* this Court reiterated that the standard of patentability is one of constitutional dimension and stated (quoting from *Graham v. John Deere Co.*, 383 U. S. 1, 6 (1966)):

> " 'Moreover, Congress may not authorize the issuance of patents whose effects are to remove existent knowledge from the public domain, or to restrict free access to materials already available. Innovation, advancement, and things which add to the sum of useful knowledge are inherent requisites in a patent system which

> by constitutional command must "promote the Progress of . . . useful Arts." This is the *standard* expressed in the Constitution and it may not be ignored.' "

396 U. S. at 61 (emphasis by the Court).

The issue before the Court in *Anderson's-Black Rock*, as here, was whether a combination patent was obvious and therefore invalid pursuant to 35 U. S. C. Section 103. The Court, reiterating the teaching of *Graham, supra*, stated that this statutory provision was not intended to change the required general level of patentable invention as expounded in prior decisions of the Court, 396 U. S. at 62, notably in *A & P Tea Co. v. Supermarket Corp., supra.* And from these and other decisions, it is evident that an extremely careful review of the patentability of combination patents embodying no new mechanical concept is necessary to comply with the Constitutional standard as implemented by Congress and expressed in the decisions of this Court. This was precisely the review undertaken by the Court of Appeals here.

In any event, this Court has encouraged a thorough review of the ultimate question of validity of which obviousness is often the ultimate issue, notwithstanding the applicability of F. R. Civ. P. 52(a) to narrower fact questions. In *Calmar, Inc. v. Cook Chemical Co.*, 383 U. S. 1, 26 (1966) (decided at the same time as and as a part of *Graham v. John Deere Co.*, 383 U. S. 1 (1966)), this Court made an independent review of the record unlimited by the strictures of F. R. Civ. P. 52(a) for the ultimate determination of obviousness. A similar review was conducted in *Graham* itself, and is even more appropriately conducted where no new elements are disclosed in the patent in light of *Anderson's-Black Rock, supra.*

This is not to say that facts found by the district courts are to be ignored in patent cases, nor were they here. The Court of Appeals, for example, did not dispute that '390 was commercially successful, that the prior art did not disclose the elements combined in the precise fashion disclosed in '390, 489 F. 2d at 246, or that the combination resulted in greater convenience and ease. *Id.* What the court did correctly hold was that any achievement was one of mechanical improvement and not of patentable invention. 489 F. 2d at 246. In this process of analysis, no issue is presented worthy of review by this Court.

III. The Court of Appeals Correctly Apprehended the Prior Art and Correctly Determined the Obviousness of the Patent in Suit.

The Court of Appeals found each element claimed in '390 disclosed in prior art patents. 489 F. 2d at 246. Petitioner apparently concedes this conclusion, since it had already conceded in the Court below that all the elements were old. 489 F. 2d at 246. In view of this proper concession and in view of the incontestable conclusion that these elements were used in cargo loading and unloading gear on board ships in similar ways to the '390 device:

> ". . . it becomes increasingly difficult to perceive what it is that Blohm & Voss claims as invention. On oral argument, counsel stated that the point of invention is the specific combination. Of course, the fact that the elements are all old in the art does not necessarily mean the patent is obvious, nor is the use of hindsight permitted, *Graham*, 383 U. S., at p. 36, 86 S. Ct. 684, but as cautioned by the Supreme Court in *A&P Tea Co.*, supra, such a claim must be closely

scrutinized, bearing in mind the 'difficulty and improbability of finding invention in an assembly of old elements.' *A&P*, 340 U. S., at p. 152, 71 S. Ct., at p. 130. This would be particularly true where, as here, the concept employed in the patent is also admitted to be old in the art."

489 F. 2d at 246.

The Court of Appeals noted that Sprengel '390 was the first to combine the elements in the precise fashion exemplified in his drawings, that it filled a commercial need and enjoyed commercial success. But while the combination resulted in greater convenience and ease of operation, it did not produce a new or different function. In short, inventiveness was lacking. 489 F. 2d at 246.

Heeding the admonition of *A&P Tea Co., supra,* the Court of Appeals applied its teaching to '390:

"'A patent for a combination which only unites old elements with no change in their respective functions, such as is presented here, obviously withdraws what already is known into the field of its monopoly and diminishes the resources available to skillful men. This patentee has added nothing to the total stock of knowledge, but has merely brought together segments of prior art and claims them in congregation as a monopoly.'"

489 F. 2d at 247, quoting 340 U. S. at 152-53.

It would be hard to find a more appropriate case for the application of this principle. In the district court, infringement was found under the doctrine of equivalents for utilization of these concepts, all old in the art, in a manner which did not even read on the claims of '390, 346 F. Supp. 1143-46. Even were infringement not found,

however, patents such as '390 chill the use of concepts old in the art for fear of expensive and protracted patent litigation. That result is statutorily and constitutionally impermissible. The holding of the Court of Appeals properly recognizes as much, and leaves no issue worthy of review by this Court.

CONCLUSION.

For the foregoing reasons, the Petition for a Writ of Certiorari should be denied.

Respectfully submitted,

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ADDENDUM A.

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489 F. 2d 231-32

[231]

BLOHM & VOSS AG, Plaintiff-Appellee,

v.

PRUDENTIAL–GRACE LINES, INC.,
Defendant-Appellant.

No. 73-1058.

United States Court of Appeals,
Fourth Circuit.

Argued May 8, 1973.

Decided Dec. 6, 1973.

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John G. Harkins, Jr., Philadelphia, Pa. (Robert A. Shelton, Venable, Baetjer & Howard, George J. Harding, 3rd, Frank A. Follmer, Lloyd R. Ziff and Pepper, Hamilton & Scheetz, Philadelphia, Pa., on brief), for defendant-appellant.

Francis I. Carr, New York City (J. Cookman Boyd, Jr., Sauerwein, Boyd & Decker, Baltimore, Md., Douglas G. Brace, Arthur D. Gray and Kenyon & Kenyon, Reilly, Carr & Chapin, New York City, on brief), for plaintiff-appellee.

Before BRYAN, Senior Circuit Judge, and WINTER and WIDENER, Circuit Judges.

WIDENER, Circuit Judge:

Appellant Prudential-Grace Lines, Inc., presents the court with three issues:

> I. Whether the district court, 346 F. Supp. 1116, erred in determining that plaintiff-appellee's patent is valid as against the defenses of (1) obviousness and (2) failure to recite a necessary structure.
>
> II. Whether the district court erred in determining that defendant-appellant's ship cargo gear infringes appellee's patent.
>
> III. Whether the district court erred in determining that plaintiff-appellee is not barred from recovery on the theory that the patent was misused.

This patent case involves the field of ship loading and unloading apparatus, commonly known and referred to as cargo gear. Plaintiff-appellee Blohm & Voss AG (hereinafter Blohm & Voss) is a West German shipbuilder. On February 15, 1966, Blohm & Voss acquired the assets, including patent rights, of H. C. Stulcken Sohn, the original assignee of the patent in suit. The patent in suit, United States Letters Patent No. 3,236,390, was issued to H. F. C. Sprengel, a German inventor. Sprengel '390 was granted February 22, 1966, based upon patent application No. 403,441 filed by Sprengel on October 2, 1964. Such patent application was a continuation-in-part of Sprengel's then co-pending United States patent application No. 361,422 filed April 24, 1964. No. 361,422 was abandoned when Sprengel '390 was filed.

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Sprengel '390 discloses apparatus which is mounted on the deck of a ship to facilitate loading and unloading of

cargo.[1] While the gear has many components, it is basically

1. Those more mechanically or nautically inclined may find Sprengel's description from the patent more enlightening than the court's hopefully simplified explanation.

> "This invention relates to a ship's loading apparatus. It relates particularly to a cargo boom for a ship. It relates more particularly to a cargo boom intended to be installed in through-swinging manner between uprights on a ship's deck to serve hatches both forward and aft of the boom mounting, and it relates still more particularly to a cargo boom of the kind described which has a pendulum purchase block fitting adopted to swing or be swung past the boom in either direction depending upon whether the boom is serving a forward or an aft hatch.
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> * * *
>
> "It is an object of the present invention to simplify the swinging through maneuver so that relatively untrained operating personnel can carry it out safely and without difficulty, and to reduce the time required for this maneuver to a minimum.
>
> "It is another object of the present invention not only to permit a cargo boom to be moved in a continuous manner from a position over a forward hatch to one over an aft hatch and vice versa, but also to permit it to alternate for short periods of time between positions over the forward and aft hatches for the loading and unloading of cargo.
>
> "For the accomplishment of the foregoing objects the present invention provides a cargo boom having at least one purchase block fitting at its upper end which is mounted to swing from side to side of the boom, that is, from forward to aft of the boom and vice versa, as a normal rather than an inverted pendulum, and which is provided with two turning heads each of which carries a guide sheave above the upper end of the boom proper. Specific embodiments of this invention include one in which the purchase block fitting is overhung on its pivot pin alongside the boom, another in which the boom is forked at its upper end with the purchase block fitting being pivotally mounted within the fork structure and thus adapted to swing through the boom, and another in which a pair of purchase block fittings are rotatively overhung along opposite sides of the boom.
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> "In the utilization of the present invention the hauling parts of a purchase tackle are led from a lower purchase block through passages in a novel fitting from which the purchase tackle and purchase blocks are suspended, to and over guide sheaves on this fitting, and from there either directly to guide sheaves in hollow rotating heads on top of the uprights between which the boom is mounted and between which it swings, or intermediately

assembled around three main structures, a boom and two kingposts. The kingposts are massive vertical structures affixed to the sides of the ship's deck, one port and one starboard directly across from one another. Located in between the kingposts is a long pole of lesser diameter called the boom. The boom is attached at its bottom end (foot) to a universal joint [2] on the ship's deck so that it may be pointed not only fore and aft but also outboard to port or starboard, and led up and down. Movement of the boom is controlled by cables which lead from winches to the upper part of the kingposts and thence to the upper part

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(head) of the boom. These are topping lifts. The top of the boom in each of the three embodiments disclosed by Sprengel '390 is constructed so that a cable or cables suspend therefrom. This cable and associated blocks to mul-

1. (Cont'd.)

to another fitting, tackle, and block arrangement similar to the first. From the guide sheaves in the heads on top of the uprights, the hauling parts are led to guide sheaves within the uprights and thence out through slots in the walls of the uprights, going finally to the drums of two cargo winches.

"When the boom is swung back or forth between the adjacent uprights to serve an aft or a forward hatch, the hauling parts are carried over the top of the boom throughout its whole movement as the purchase block fitting is at all times oriented substantially vertically downwardly as a normal pendulum from its pivot point at or very close to the boom's upper end. Thus the hauling parts of the purchase tackle, led over the guide sheaves on the inventive pendulum purchase block fitting as aforesaid, do not interfere at all with the swinging through maneuver."

2. While this may not be a true universal joint in that it is not designed to transmit rotary motion, a part of its function is the same. It allows rotation of the boom around its own longitudinal axis if in a position perpendicular to the deck and also movement of the boom around its bottom end in a plane perpendicular to the deck of the ship. The combination of the two movements will allow the boom to theoretically occupy any part of the space in the hemisphere, the center of the base of which is the universal joint.

tiply power is the purchase (purchase gear). Affixed to the lower end of the purchase is a hook to which the cargo to be lifted is attached.[3]

Sprengel '390 is devised so that the single boom may tilt forward to accommodate loading and unloading of the forward hatches, and also tilt aft to accommodate the after hatches. At all times, including while the boom is in motion, it is affixed at its foot to the universal joint. Activating the winches which control the cables leading from the king-posts to the top of the boom controls the movement of the boom. To illustrate, assume the boom is dead center and perfectly upright. Activating the winch on the starboard side to take in cable and the winch on the port side to pay out cable would cause the boom to lean toward the starboard

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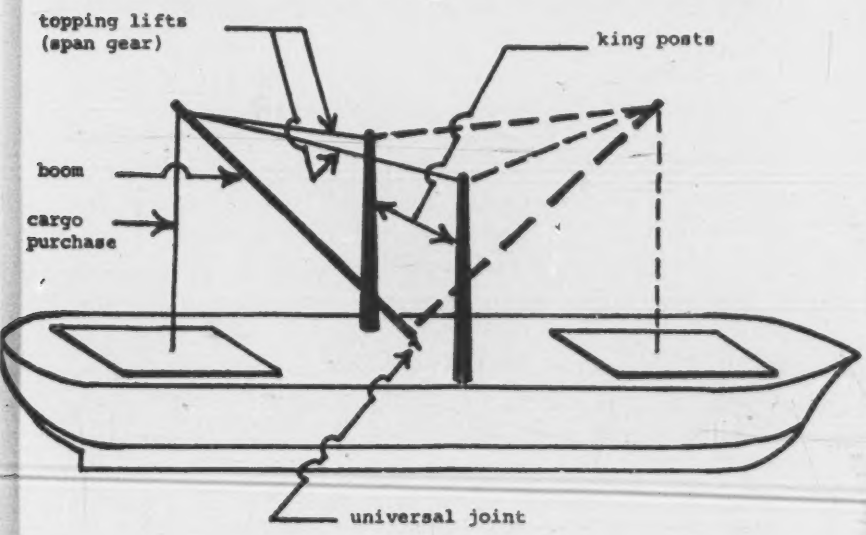
3. The sketch below indicates those components common to cargo gear rigs discussed in this opinion. Solid lines show gear rigged to work after hatch. Dotted lines show gear swung through to work forward hatch.



kingpost. If both winches were activated at the same time to pay out cable, the boom would swing either forward or aft depending upon which way (forward or aft) it is shoved off dead center. Once it is off dead center, its own weight causes it to gravitate toward the deck and the cables prevent the boom from crashing down onto the deck like a felled tree. By paying out the proper amount of cable, the boom may tilt forward or aft any desired number of degrees. To raise the boom, both winches take in cable.

Once the cargo is attached to the hook suspended from the purchase, and raised from the hold, the boom will be swung either to port or starboard to unload the cargo. Assuming the unloading is to port, the portside winch would take in cable and the starboard winch would pay out cable which would cause the boom to point to port, thus swinging the suspended cargo over the ship's side and above the unloading pier or barge.[4]

The cables previously referred to which suspend vertically from the top of the boom are rigged through blocks. A

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block is a more sophisticated and proficient version of what is commonly known as a pulley. Sprengel '390 discloses the use of blocks which are suspended from the top of the boom. One block, called the upper purchase block, is suspended from and attached to a fitting which fitting is affixed to one side of the top of the boom. The cables which suspend from this block lead down to the other block, which is called the lower purchase block. The cargo is attached to a hook which is affixed to the bottom of the lower block. The fitting from which the upper purchase block suspends is attached to a cross pin which runs at right angles to the

4. Sideways movement of the boom is called slewing.

longitudinal axis of the boom and through the boom near its top in a plane parallel to the deck.[5] It protrudes slightly out from the boom. The fitting rests on the protruding part of the pin alongside the boom so that the purchase blocks which suspend from the fitting likweise suspend down alongside the boom. Simply stated, configuration is not unlike the human body with the arms considered the purchase gear, the shoulder joint the fitting, and the body the boom.

Sprengel '390 discloses three embodiments, two of which employ the above described gear. In one of the embodiments, the purchase gear suspends from only one side of the boom—like a man with one arm, if you will. In another embodiment, purchase gear suspends from both sides of the boom and accommodates heavier loads. In both embodiments, the purchase gear suspends like a pendulum from the fitting attached to the cross pin which extends through the top of the boom. In both embodiments, the fitting from which the purchase gear suspends pivots on the cross pin to allow the purchase gear to swing alongside the boom as the boom moves through its vertical plane fore and aft.

The alleged inventiveness of Sprengel '390 rests in the method by which it serves both forward and after hatches without rerigging.[6] Assume that the gear is set up to serve the forward hatch, in which case the boom would be tilted forward and the purchase gear suspended from the top of the boom down to the hatch. To service the after hatch, the boom would be raised until it is upright between the kingposts (dead center) and then lowered toward the after

5. References here and following to the various pins at or near boom or davit heads in a plane parallel to the deck refer to the normal operating position.

6. It is readily apparent that rerigging of at least some of the purchase gear would be required if some method did not exist to allow the purchase gear to swing alongside the boom in its transit from forward to after hatches, and vice versa.

hatch. During this maneuver, the purchase gear (in the single gear and the double gear embodiment) which suspends from the side or sides of the top of the boom would simply swing alongside the boom and when the boom is tilted so that its uppermost part is over the after hatch, the purchase gear would be lowered down to the hatch. In the double gear embodiment, a fitting attached to both lower purchase blocks is uncoupled on one side to allow the purchases to pass on opposite sides of the boom.

As previously mentioned, cables which run from the top of the kingposts to the top of the boom control movement of the boom. Such gear is collectively called span gear, by Sprengel, but is nothing more nor less than topping lifts. The two span gear winches are located on the deck of the ship, one near each kingpost. The cables lead from the winches up through the kingposts and out the top and then over to the top of the boom. The span cable from each kingpost is attached to an end of the cross pin which extends through the head of the boom. There are pulleys attached to the ends of the cross pin called span blocks through which these cables run. The cables enter the top of the kingposts on circular runners called guide sheaves.[7] The taking in and letting out

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of these cables raises and lowers the boom as well as slewing it. The cables, which together with the upper and lower purchase blocks comprise the purchase gear, likewise have their origins at winches on the ship's deck, one near each kingpost. The hauling part of the purchase tackle is that part which is led from a purchase block to the winch for hauling it in and out to raise and lower the lower block. The cable is led by guide sheaves from the winch into and up

7. A sheave is the rotating wheel of a block or pulley over which the line reeves.

through the top of the kingpost and then down through the pendulum fitting and around the upper and lower purchase blocks.

Sprengel disclosed his concept in a third embodiment which is for all practical purposes the same as the two previously discussed except for the configuration at the head of the boom. The boom in the third [8] embodiment resembles a giant needle with an oversized eye. The eye is formed however with straight lines so that it resembles a simple fork or "Y" which almost closes at the top instead of remaining totally open like a "Y". A pin (again perpendicular to the longitudinal axis of the boom and in a plane parallel to the deck) extends through the top of the fork connecting each side of the top of the "Y". A fitting rests on this pin, inside the fork of the "Y," just like the fitting which rests on the cross pin at the head of the boom in the two other embodiments. This fitting rotates freely around the pin. Suspended from this fitting is the purchase gear, an upper purchase block and a lower purchase block. To illustrate the working of the third embodiment of Sprengel '390, assume that the boom is tilted forward so that the top is over the forward hatch. The purchase gear would be suspended from the top of the boom down to the hatch. To service the after hatch, the boom would swing through the kingposts as in the other embodiments. The method of moving the purchase gear is, however, different. The upper and lower purchase blocks are drawn up closely together and the hauling part is taken in so that the entire suspended length of the purchase gear does not exceed the length of the opening of the "Y" at the top of the boom. The fitting on the cross pin rotates around the axis of the pin to allow the purchase gear to swing through the opening in the top

8. In the patent itself this is called the second embodiment. Since the double pendulum is merely a duplicate of the single pendulum embodiment, it is more logical here to take them up first.

of the boom as the boom swings through the kingposts. After the boom clears dead center, the purchase gear may be lowered; and once the top of the boom is over the hatch, it is lowered down to the hatch. If the crew attempted to swing the boom to serve the opposite hatch without drawing up the purchase gear, such gear would strike the boom as the boom swung through. By drawing up the purchase gear, such gear swings through the opening in the top of the boom.

Blohm and Voss sued the appellant Prudential-Grace Lines (hereinafter Grace), claiming that the cargo gear on Grace ships infringed Sprengel '390. Grace denied infringement and claimed that the patent was invalid for failure to recite a necessary structure and invalid for obviousness. Grace also claimed that certain license agreements entered into by Blohm & Voss rendered the patent unenforceable on grounds of misuse. Because we conclude that Sprengel '390 is invalid because of obviousness, we do not reach the other issues.

The conditions of patentability are set forth in the Patent Act in three sections, 35 U. S. C. §§ 101, 102 and 103.[9]

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9. "§ 101 *Inventions patentable*

"Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title."

"§ 102 *Conditions for patentability; novelty and loss of right to patent*

"A person shall be entitled to a patent unless—

"(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or

"(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale

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Sections 101 and 102 express the new and useful tests.[10] Section 103 expresses the non-obvious test with which we are most concerned here. In Graham v. John Deere Co., 383 U. S. 1, 17, 86 S. Ct. 684, 694, 15 L. Ed. 2d 545 (1965), the Supreme Court carefully analyzed the content and history of the standards for patentability and enunciated

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9. (Cont'd.)

in this country, more than one year prior to the date of the application for patent in the United States, or

"(c) he has abandoned the invention, or

"(d) the invention was first patented or caused to be patented by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application filed more than twelve months before the filing of the application in the United States, or

"(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for the patent, or

"(f) he did not himself invent the subject matter sought to be patented, or

"(g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other."

§ 103. *Conditions for patentability; nonobvious subject matter*

"A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the difference between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made."

10. See Graham v. John Deere Co., 383 U. S. 1 at 12, 86 S. Ct. 684, 15 L. Ed. 2d 545 (1965).

the following standards for decisions in patent cases which must guide us here:

> "While the ultimate question of patent validity is one of law, A & P Tea Co. v. Supermarket Corp. [340 U. S. 147, 71 S. Ct. 127, 95 L. Ed. 162 (1950)], at 155, the § 103 condition, which is but one of three conditions, each of which must be satisfied, lends itself to several basic factual inquiries. Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy."

It is clear from *Graham* and United States v. Adams, 383 U. S. 39, 48, 86 S. Ct. 708, 15 L. Ed. 2d 572 (1965), decided the same day as *Graham*, that not only must the invention meet the tests of novelty and utility, it must also be non-obvious in accordance with the standards there set forth. In *Graham*, the court admonished that the non-obvious criteria should be honored by "strict observance" (p. 18, 86 S. Ct. 684). Such strict observance was reiterated in Anderson's-Black Rock v. Pavement Co., 396 U. S. 57, 62, 90 S. Ct. 305, 24 L. Ed. 2d 258 (1969). Not only must the criteria be strictly observed, we are told by the Supreme Court that "Courts should scrutinize combination patent claims with a care proportioned to the difficulty and improb-

ability of finding invention in an assembly of old elements." A & P Tea Co. v. Supermarket Corp., 340 U. S. 147, 152, 71 S. Ct. 127, 130, 95 L. Ed. 162 (1950). Of like effect is this

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court's statement in Heyl & Patterson, Inc. v. McDowell Co., 317 F. 2d 719, at 722 (4th Cir. 1963): "It is usually difficult to find true inventiveness in a combination patent."

With these basic considerations in mind, we turn to the patent in suit.

Scope and content of the Prior Art

Obviously, the field of ship's cargo loading and unloading gear is relevant to the inquiry, and it would seem only reasonable to consider the area of ships' gear generally and how the mechanical principles of force have been utilized in such gear. Cf. Mott Corp. v. Sunflower Industries, Inc., 314 F. 2d 872 (10th Cir. 1963); A. J. Deer Co. v. U. S. Slicing Machine Co., 21 F. 2d 812 (7th Cir. 1927).

The basic idea of booms, blocks, lines and winches is, of course, quite old. A perusal of manuals of seamanship and texts crusty with age indicate that principles of hoisting utilizing the mechanical advantage of lines and pulleys have been employed on ships at least as early as the 1700's. See Steel's Elements of Mast Making, Sailing and Rigging, from the 1794 edition, W & G Foyle, Ltd. London. A leading text, Knight's Seamanship, which was cited to the district court and this court, also reveals that use, utility, and the mechanical advantage of upright supports, blocks, and lines is quite old. A drawing in a British Standards Institution publication (BS 302: 1938, figure 23) depicts a typical ship's derrick rig. Such rig discloses a boom mounted on a universal joint which tilts along a vertical plane and may be slewed outward. Upper and lower purchase blocks sus-

pended from the top of the boom are disclosed. Topping lifts from the mast to the boom are disclosed, as are hauling blocks to take up the purchase cable. Bearing in mind that gear to serve one hatch was well developed at least by 1930,[11] we turn to the more pertinent area of two-hatch gear and the concept of swinging the boom and purchase gear through to serve fore and aft hatches.

1. William B. Ashe, No. 1,257,664 (1918).

Ashe '664 relates to an apparatus known as a boat davit, the purpose of which is to facilitate the employment of small boats carried on shipboard. When the boat is not in use, it is suspended by ropes between two vertical supports called davits. As a practical matter, boats are nearly always cradled on board ship when not in use. Among other advantages, this keeps the strain off the purchase blocks and tackle. The davits are located at or near the side of the ship and the boat suspends between them. They are secured at the base by a pivot joint allowing movement in a vertical plane perpendicular to the center line of the ship. Each davit has a pin which protrudes near its top. A fitting is attached to this pin, freely rotating around the pin, so that the fitting may swing back and forth like a man's arm if the vertical support be considered the body. A block is suspended from this fitting and the lines from this upper block lead down to a lower block. The ends of

11. It is axiomatic that the use of booms and their associated gear as a means for handling the heavy weights (cargo, sails, ammunition, etc.) encountered on board oceangoing ships is very nearly as old as shipbuilding. The Notebooks of Leonardo da Vinci, for example, p. 638 (Edited by MacCurdy, 1954), describe a method of calculating mechanical advantage for block and tackle rigs. Specific reference to publications is made only to indicate the availability of reference material showing that the age of the components of the patented device far antedates the patent in question, without attempt to accurately date the origin of many of the parts which may very well be lost in antiquity.

the lifeboat are attached to these lower blocks so that it is suspended from the davits. When the boat is not in use, the davits lean inboard so that the lifeboat is suspended over the deck. To lower the boat, the davits are pointed out over the water. As the davits swing outboard, the lifeboat swings in between them and out over the water.

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During this maneuver, the upper purchase block (and lower, of course) swings alongside the davit *like a pendulum*. Not only do the blocks swing inboard and outboard, the upper pendulum block fitting which is attached to the side of the top of the davit also swings inboard and outboard. The district court discussed the Ashe patent but gave little or no weight to it because, among other things, it felt that davits, while they may loosely resemble booms, are primarily for lowering, and a boom must lower, raise and transfer. To the extent that such analysis was based on the assumption that davits do not raise, lower and transfer, it was clearly erroneous. Davits raise, lower, and transfer the boat both inboard and outboard. The district court took its definition of davit, which mentions only the lowering of life craft, from the Patent Office classification definitions. Never mentioned was the obvious fact that a ship's boats are taken on board each time they are launched at sea. Webster's New International Dictionary, 2nd Ed., defines davit as a form of crane, of metal or wood, fixed or movable, projecting over the side of a vessel or hatchway, for hoisting boats, anchors, accommodation ladders, cargo, etc. Knight's Modern Seamanship, 10th Ed., gives a definition of davit as a curved metal spar fitting in a socket on deck and projecting over the side or stern for hanging a boat or handling weights. Ch. VII of *Knight's* also illustrates various davits, some of which are not inset in sockets, as Ashe is not, and includes subheads on lowering and hoisting lifeboats at sea. Ob-

viously, Ashe '664 is not precisely the same as Sprengel '390 but Ashe clearly discloses a load bearing support (the davit) which swings through a vertical plane employing a pendulum fitting (from which the purchase is suspended) which facilitates a *pendulum-like movement* of the hoisting gear *alongside* the support. The opinion of the district court gave insufficient credence to what it did teach and too much credence to the differences between Ashe '664 and Sprengel '390. Because Ashe did not anticipate Sprengel '390, the district court seemed to reason that the teachings of Ashe were virtually worthless because of their disclosure in the context of a davit rather than a cargo boom. Ashe was clearly relevant for the mechanical teachings it disclosed and should not have been so restrictively treated. Davis v. Matthews, 361 F. 2d 899, at 901 (8th Cir. 1966); Ramirez v. Perez, 457 F. 2d 267 (5th Cir. 1972); Beckman Instruments, Inc. v. Chemtronics, Inc., 439 F. 2d 1369 (5th Cir. 1970).

2. Kohnenkamp, et al., No. 2,914,193 (1959).

Sprengel himself was the co-patentee of '193. It was the first workable solution to the problem to serving forward and after hatches with one boom, and it was a commercial success. Kohnenkamp '193 is similar to Sprengel '390 with the exception of the boom head configuration and the gear at the head of the boom. The boom at its head resembles a "Y" or a simple fork; in fact, '193 has been referred to as the "old fork" and Sprengel's third embodiment in '390 as the "new fork." The single set of purchase blocks suspends between the arms of the fork. There is no pin or connecting piece between the arms except at the throat of the "Y" from which is suspended the upper purchase block from a fitting which functions much like the pendulum fitting in Sprengel '390. Each arm has a guide

sheave at its end and the cable from each arm runs down to the purchase blocks so that each end of the purchase is a hauling part. When the boom is swung through, the purchase gear is drawn up closely to place the upper and lower purchase blocks together. The boom is then closely swung across the vertical, and to the opposite direction, and the lower purchase block is then lowered down the opposite side of the boom after the boom swings through. Despite the success of '193, there were shortcomings. Due to the height of the head of the boom at the point at which the purchase gear

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passed through the uprights, it was difficult to view and thus tricky to operate under even good conditions and more so at night or in bad weather. Highly skilled crewmen were required to complete the maneuver. Also, great care had to be exercised to insure that the lower purchase block was drawn up close enough to swing through the fork but not so tight as to foul the rigging of the blocks. It is not necessary to further describe in detail '193. It works exactly like '390 except for the different boom head configuration and the resulting swing through of the lower purchase block above the upper, rather than below it in a pendulum-like motion.

3. Lehmann No. 3,042,222 (1962).

Lehmann '222 recites in the patent the problems encountered in using one boom to serve both forward and after hatches and proposes to disclose gear which can accomplish the end without the problems. The boom, according to Lehmann '222, has two legs through which the hoisting gear may freely swing when the boom is swung through to serve the hatches forward and aft. A load bearing cross

piece, perpendicular to the longitudinal axis of each boom leg in a plane parallel to the deck, is mounted between the legs of the boom at their top. On the cross piece is a fitting which rotates freely around the cross piece and from which fitting is suspended the purchase gear. The boom is mounted on a platform on the ship's deck which rotates. This is nothing more nor less than a universal joint. As the boom swings through the kingposts, the purchase gear suspended from the cross piece swings through the legs of the boom like a pendulum. A reading of the patent discloses that cables from the kingpost are taken up or let out simultaneously to raise and lower the boom. The finding of the district court that Lehmann '222 taught a boom which rotates on a 180 degree axis to *face* one hatch and then *turn* to face the other hatch was cleary erroneous. Lehmann '222 instead discloses a boom which is raised and lowered, not rotated, to accommodate both hatches, precisely in the same manner as Sprengel '390. It is also clear that Lehmann '222 discloses purchase gear which swings between the legs of the boom, alongside each leg, like a pendulum, again precisely like Sprengel '390.[12] Lehmann '222 is a paper patent; it has never been installed on any ship. The

12. See Column 1, lines 34-36; column 1, line 43; column 2, lines 61-70; column 3, line 49; and column 3, line 64 of Lehmann '222. Claim 1 reads as follows:

"1. A cargo lift gear comprising two kingposts, a boom consisting of two legs, pivotal bearing means connected to the lower ends of the boom legs and mounting the boom for pivotal movement between said kingposts, and to either side of the plane defined by the kingposts, a loadbearing cross piece connecting the upper ends of the boom legs, a hoisting gear including upper and lower hoistive block means, the upper hoisting block means being supported by said cross piece substantially midway between the boom legs and the two boom legs defining an unobstructed clearance to permit the hoisting gear to pass between the legs, and topping life blocks attached to the upper ends of the boom legs at their outsides and to the kingposts for controlling the position of the boom."

issuance of the patent, however, creates a presumption that it is workable. Simmons Co. v. A. Brandwein & Co., 250 F. 2d 440, 447 (7th Cir. 1957); Application of Reynaud, 51 C. C. P. A. 1310, 331 F. 2d 625, 628 (1964). And the alleged unworkability of a patent does not necessarily preclude its relevance in ascertaining the scope and content of the prior art. Hadfield v. Ryan Equip. Co., 456 F. 2d 1218 (8th Cir. 1972); Sutter Products Co. v. Pettibone Mulliken Corp., 428 F. 2d 639 (7th Cir. 1970).

4. Lehmann No. 3,107,790 (1963).

Lehmann '790 discloses a single boom structure attached at its foot to a universal type mounting between two kingposts. The kingposts may be the massive conical type or they may be constructed like tripods. The boom swings

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fore and aft through the kingposts and may also slew outboard to port or starboard. In at least one embodiment, the hollow boom head of '790 is fitted with a cap which inserts into the boom head and rotates freely about the longitudinal axis of the boom. The topping lifts are attached to the cap. The hoisting gear is attached to and suspended from a fitting pivotally attached to pins protruding from the head of the boom below the freely rotatable cap. In Lehmann's own words:

> "[A] hoisting gear is preferably pivotally suspended from the boom head and a hoisting gear lead line runs over a guide block at the heel of the boom to a hoisting winch which is positioned laterally offset from the longitudinal center plane of the rig in the plane of the kingposts. *The hoisting gear is swung through a free space between the boom and the adjacent kingpost opposite the position of the hoisting winch or on the same*

side thereof. In this manner, all running gears remain unchanged in their relative position to the boom, kingposts and winches while the boom is shifted from hatch to hatch." [Emphasis added] Column 1, lines 43-47, Lehmann '790.

Lehmann '790 was installed on two ships. Lehmann '790 was cited to the district court but was only referred to in its opinion briefly ("rotating heads" 346 F. Supp. at 1126) and apparently was not heavily relied upon by defendant as rendering Sprengel '390 obvious. It is, however, a part of the record and is relevant on the concept of suspended purchase gear which swings through with the boom. It provides for a swing through of the purchase gear, like a pendulum, as does Sprengel '390. The swing through of the purchase without rerigging in '790 is accomplished by rotating the boom while in a nearly upright position, the boom being pivoted at both ends.

5. Sparrow No. 3,110,403.

Sparrow '403 was issued on November 12, 1963, and is commonly referred to as the Newport News gear. The gear was developed in 1962 during construction of five Challenger class cargo ships which Newport News Shipyard built for United States Lines. This gear works; it has been installed on cargo ships, and has enjoyed regular commercial use. Sparrow '403 discloses a single boom structure mounted on the deck on a universal type joint. The boom is mounted between two kingposts. The boom may swing forward and aft between the kingposts and slew outboard to port or starboard. In Sparrow, as in Lehmann '222 and '790, Kohnenkamp, and Sprengel '390, movement of the boom is controlled by blocks and cables extending from the kingposts to the head of the boom. Sprengel '390

calls it span gear; the others call it topping lifts—there is no difference except in semantics. Sparrow utilizes a rotary sleeve just below the boom head. The sleeve, simply stated, has a padeye protruding outward. The purchase gear suspends from the padeye. Sparrow's language is clear enough to merit quotation:

> "The cargo fall [12a] of the present invention includes an upper purchase block which is supported from a cargo fall support means mounted at the head portion of the boom. This cargo fall support means is rotatably mounted with respect to the boom and is axially fixed with respect thereto. *This permits the cargo fall support means to be swung from side to side of the boom* such that in moving from one hatch to another, the cargo support means can be swung through an angle of 180 degrees for disposing the upper purchase block in proper operative position with respect to the boom over either of the two hatches with which the boom is employed." [Emphasis added] Column 1, lines 55-66, Sparrow '403.

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Sparrow '403, while cited to the district court and discussed in the briefs to this court, was apparently not pressed below. Why it was not pressed is not clear, but we may not ignore its relevance as a part of the prior art. Sparrow discloses a successful means for serving forward and after hatches without the highly skilled operators needed and danger which attended the old fork. Sparrow also discloses purchase gear which swings alongside the boom as the boom swings through the vertical, like a pendulum. The sleeve

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12a. Fall, as used here and for the purpose of this opinion, is synonymous with purchase.

at the boom head may be rotary, but the drawings and the claims clearly disclose purchase gear which swings alongside the boom as the boom swings through the kingposts.

The Differences Between the Prior Art and the Claims at Issue

Blohm & Voss alleges that the gear on Grace's ships infringed claims 1, 2, 3, 14, 15 and 18 of Sprengel '390. The district court found that claims 1, 2 and 3 were not infringed but that claims 14, 15 and 18 were infringed.[13] Blohm & Voss did not cross appeal the no-infringement findings of claims 1, 2 and 3. Therefore, the validity of such claims is not at issue. The claims at issue are 14, 15 and 18 of Sprengel '390. The other claims, however, may be relevant because they disclose the various methods by which the inventor's concept may be employed. If the inventor says that one embodiment of his patent employs the same concept as another embodiment of his patent, then prior art similar to either embodiment would seem to bear on the issue of obviousness.[14]

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13. This holding resulted from the district court's conclusion that the Grace gear capable of 30 ton capacity did not infringe the claims (1, 2, and 3) of '390 which disclosed a single purchase fitting, but that Grace's 80 ton capacity gear did infringe the claims of Sprengel '390 (14, 15 and 18) which disclosed the double purchase gear.

14. The specific claims at issue are as follows:

(a) Claim 14

Claim 14 of Sprengel '390 reads as follows:

"The combination comprising (1) a cargo boom having an upper end and a lower end, (2) a head pin extending transversely from opposite sides of said cargo boom near the upper end thereof, and (3) a pair of purchase block fittings, each fitting adapted to have an upper and a lower purchase block and associated purchase tackle suspended from it, each fitting being pivotally mounted closely adjacent said cargo boom to swing from side to side of said cargo boom as a normal pendulum

At the outset, we note that there are some differences between Sprengel '390 and each prior art reference, just as there are some differences between the

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prior art references themselves. Ashe's boat davit is necessarily different in some respects. Yet, in both Ashe and Sprengel '390 a load bearing support (call it a boom, a davit or whatever) is affixed to the ship's deck so that it may tilt

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14. (Cont'd.)

with said boom in substantially upright position, one fitting being so mounted on one extension of said head pin and the other fitting being so mounted on the opposite extension of said head pin, and each fitting including guide means extending above the upper end of said boom in upright position which is adapted to receive the hauling parts of the purchase tackle, and direct the same away from said boom.

(b) Claim 15

"The combination according to claim 14 in which said head pin extends sufficiently transversely from two opposite sides of said cargo boom to provide attachment points for span tackles at equal distances from the longitudinal axis of the boom, each of these attachment points being beyond the purchase block fitting mounted on the respective extension.

(c) Claim 18

"The combination comprising (1) a cargo boom having an upper end and a lower end, (2) a head pin extending transversely from the opposite sides of said cargo boom near the upper end thereof, (3) a pair of purchase block fittings, each fitting being pivotally mounted closely adjacent said cargo boom to swing from side to side of said cargo boom as a normal pendulum with said boom in substantially upright position, one fitting being so mounted on one extension of said head pin and the other fitting being so mounted on the opposite extension of said head pin, and each fitting including guide means extending, above the upper end of said boom in upright position which is adapted to receive the hauling parts of the purchase tackle and direct the same away from said boom, (4) a pair of upper purchase blocks, each suspended from a purchase block fitting, and (5) a pair of lower purchase blocks, each suspended from an upper purchase block and each having a padeye depending therefrom."

back and forth (through dead center). In both, the head of the support is always directly over the matter to be raised, lowered or transferred, be it cargo or a lifeboat. In both, a fitting is pivotally mounted from a pin which protrudes from the support and is mounted at right angles to the longitudinal axis of the support in a plane parallel to the deck. In both, the purchase gear suspends from such fitting and swings alongside the support in pendulum fashion.

Kohnenkamp '193 very successfully accommodated forward and after hatches and disclosed all of '390 except for the boom head configuration and fittings used on '390's side mounted pendulum fittings, which constitutes the major difference between the two. The result of the side mounted pendulum fitting was that the danger and requisite skill problems of swinging through in Kohnenkamp '193 were solved.

There are differences between Lehmann '222 and Sprengel '390 side pendulum mounting. Sprengel '390 discloses a single boom structure, whereas, Lehmann '222 discloses a boom with two legs, or, as plaintiff calls it, two booms joined at the top. Either way, Lehmann '222 discloses a boom or booms with an opening in between, through which the purchase gear swings as the boom swings fore and aft. One could say that it swings through the opening in the single boom, like the new fork of Sprengel '390, or one could say it swings alongside the separate booms in pendulum fashion like Sprengel's side pendulum embodiments. Plaintiff, in its zeal to show that Lehmann '222 does not anticipate Sprengel '390, fails to take account of what Lehmann '222 does disclose. Its position seems to be that Lehmann '222 must anticipate Sprengel '390 or it is irrelevant. Such is not the law. Graham v. John Deere, supra, sets forth the applicable standards, and specific anticipation by a single reference is not the rule.

Although it may be said that Lehmann '790 and Sparrow '403 are enough different from Sprengel '390 to the extent that the claims of neither could be said to anticipate Sprengel (at least defendant did not so argue), both disclose quite relevant concepts.

While the methods of obtaining the pendulum swing through of the purchase gear without rerigging in Lehmann '790 and in Sprengel '390 are different, in both, when the boom is swung from forward to aft, the purchase gear swings through alongside the boom like a pendulum. When the boom is positioned at a place other than at or nearly dead center, the fittings freely rotatable around the pins protruding from the top of the boom and which support the purchase gear, have precisely the same function as does the pendulum fitting in Sprengel '390.

Both Sparrow '403 and Sprengel '390 disclose purchase gear which swings alongside the boom like a pendulum as the boom swings through the kingposts. In Sprengel '390, of course, this is accomplished by the pendulum fitting attached to the pin. In Sparrow '403, the swing through without rerigging is accomplished by having a rotary sleeve near the head of the boom which freely rotates around the longitudinal axis of the boom and from which the purchase gear is suspended by means of a fitting which enables the purchase gear to always remain vertical.

The ultimate conclusion to be drawn from these comparisons will be considered along with the conclusion of obviousness.

The Level of Ordinary Skill in the Pertinent Art

The lower court did not specifically resolve the level of ordinary skill in the pertinent art. Nor did the Supreme Court in *Graham, Adams* or *Anderson's-*

Black Rock, supra.[15] Nor have many decisions decided since *Graham*. Yet, we are of opinion the foregoing discussion has, perhaps by comparison, made the level clear. The matter seems to be one which does not otherwise easily lend itself to specific articulation. The matter also seems to be necessarily related to the inquiry of the scope and content of the prior art. The inventor who ventures into the art is presumed to know the prior art references. Judge Rich stated it picturesquely when he wrote that the inventor should be imagined as seated in his workshop "with the prior art references—which he is presumed to know—hanging on the walls around him . . . ." Application of Winslow, 53 C. C. P. A. 1574, 365 F. 2d 1017, 1020 (1966). Regardless of what the hypothetical man skilled in the art is presumed to know, the evidence before the lower court revealed that the level of ordinary skill is high. Naval architecture is a recognized specialty in the field of design and engineering. The experts who gave evidence at the trial, by testimony or by deposition, were conversant with the elements of the various cargo gear structures. The patentees in the prior art who patented two-hatch cargo gear exhibited working familiarity with the type of components disclosed in the first workable gear, Kohnenkamp '193, and the capabilities and limitations thereof. It is clear that the field of naval architecture, including design of ship's cargo gear, is a specific area of engineering specialization in which a considerable degree of expertise is not uncommon.

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15. As this court noted in Technograph Printed Circuits, Ltd. v. Martin-Marietta Corp., 474 F. 2d 798, 807, n. 16 (4th Cir. 1973), cert. den., 414 U. S. 880, 94 S. Ct. 68, 38 L. Ed. 2d 125 (1973):

> "Nowhere in *Anderson's-Black Rock* did the Supreme Court set out what was the level of ordinary skill in the pertinent art, but the court necessarily considered it because of the holding that the patent was obvious."

Conclusion as to Obviousness

With the foregoing in mind, we turn to the ultimate question of obviousness. The patent is before the court with its statutory presumption of validity. 35 U. S. C. § 282. The strength of this presumption has been a matter of considerable comment by the courts. We note first that the patent was issued during a time when the Supreme Court "observed a notorious difference between the standards applied by the Patent Office and by the courts." *Graham*, supra, 383 U. S., at 18, 86 S. Ct. at 694. In light of the fact that the court, in *Graham*, stated that the general strictness of the test of patentability has remained invariable in the Supreme Court for 20 or 30 years, perhaps the suggestion may be that the Patent Office was too permissive in its concept of invention.

Grace contends that the patent slipped through the Patent Office, while Blohm & Voss contends that the presumption is strengthened because the Patent Office considered Lehmann '222, Lehmann '790 and Kohnenkamp '193. We note that the file wrapper for Sprengler '390 shows that Ashe '664 and Sparrow '403 were not considered. This court has held, along with others, that the statutory presumption of validity is weakened where pertinent prior art is not considered by the patent office. Blumcraft v. Citizens and Southern National Bank, 407 F. 2d 557, at 561 (4th Cir. 1969); Johns-Manville Corp. v. Cement Asbestos Products Co., 428 F. 2d 1381 (5th Cir. 1970); see Skirow v. Roberts Colonial House, Inc., 361 F. 2d 388 (7th Cir. 1966); Sound Scribner v. United States, 360 F. 2d 954, 960, 175 Ct. Cl. 644 (1966). We think the net effect of all these contentions and authorities is that the plaintiff came into court with a good patent and the burden was on the defendant to prove it bad. We are of opinion the defendant met the burden.

The Supreme Court has listed as secondary considerations which may be rele-

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vant on the issue of obviousness the following: (a) commercial success; (b) long felt needs; (c) failure of others, etc. Sprengel '390 was a commercial success, as was Kohnenkamp '193. Sparrow '403 was a commercial success, although perhaps to a lesser extent. Lehmann '790 was installed in ships. Prior to Kohnenkamp '193, there had been a long felt need in the industry for a gear utilizing one boom to serve both forward and after hatches without rerigging. Kohnenkamp '193 successfully met that need. While it is doubtful that the need to improve the old fork was as great as the need for the old fork itself, there was a need for gear which could serve forward and after hatches with greater safety and lesser skill. Sparrow '403 accomplished that result and so did Sprengel '390 to a more successful extent.

These secondary considerations do not affect the analysis in this case to an extent requiring us to find nonobviousness. Commercial success without invention does not amount to patentability. *A & P Tea Co.*, supra. Thus, we come to the ultimate legal question of validity, and it is clear that it is, in the final analysis, a question of law. Graham v. John Deere, supra; Heyl & Patterson, Inc. v. McDowell Co., 317 F. 2d 719 (4th Cir. 1963); Lemelson v. Topper Corp., 450 F. 2d 845, 848 (2nd Cir. 1971); Cf. Stamicarbon, N. V. v. Escambia Chemical Corp., 430 F. 2d 920, 924 (5th Cir. 1970).

While the specific claims of Sprengel '390 at issue are 14, 15 and 18 because they were the infringed claims, all the embodiments are relevant on the issue of obviousness. This is so in this case because the inventor has disclosed a single inventive concept in three embodiments. (Single purchase

gear alongside the boom; double purchase gear, one on either side; and single gear suspended from a structure on top of the boom like a closed wishbone). The fact that the same concept is disclosed in the single and double purchase gear is expressed in the following colloquy between the district court and counsel for Blohm & Voss:

> "Now, the double pendulum block, as I believe I said at the pre-trial conference, while discussing what is invention and what is not, is nothing more than putting two of those up there.
>
> "The addition of the second block was simply conceived of by Mr. Sprengel because he wanted to increase the load that he was required to lift with the gear that was being ordered. He will testify that when required to lift the heavier load, he told his engineers to take the single pendulum block design and make a mirror image of it. That's all there is to it.
>
> "It has a single inventive concept, as I believe I tried to express to your Honor at the pre-trial conference. The concept is the utilization of a pendulum block mounted by one end of the boom for free rotation as the boom is swung through the vertical from fore to aft or aft to fore.
>
> "Whether you have one of them or whether you have two of them, the invention is the same." (Appendix (90a-91a).)

Thus, the inventiveness of Sprengel '390 does not lie in one set of purchase blocks or two sets. It would also seem that the inventiveness does not lie in having the purchase gear swinging alongside the boom because one of the embodiments has the purchase gear swing through the top of the boom. Nor does the inventiveness lie in the particular type

of fitting used at the head of the boom from which the purchase is suspended. In plaintiff's own words: "Sprengel's invention does not reside in employing *only* pendulum-block fittings having the specific configuration, including hollow passages through which the cargo hoisting rope extends, depicted in the patent in suit. If this were not so, the patent in suit would surely have included at least some claims to such a specific fitting. But it does not." And later: "There is no evidence that Sprengel ever

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asserted a patent claim to such pendulum block fittings." (Appellee's brief, p. 35). It is acknowledged that all of the elements are old in the art, and that there is nothing new in the concept of swinging through. Particularly in view of this, it becomes increasingly difficult to perceive what it is that Blohm & Voss claims as invention. On oral argument, counsel stated that the point of invention is the specific combination of elements. Of course, the fact that the elements are all old in the art does not necessarily mean the patent is obvious, nor is the use of hindsight permitted, *Graham,* 383 U. S., at p. 36, 86 S. Ct. 684, but as cautioned by the Supreme Court in *A & P Tea Co.,* supra, such a claim must be closely scrutinized, bearing in mind the "difficulty and improbability of finding invention in an assembly of old elements." *A & P,* 340 U. S., at p. 152, 71 S. Ct., at p. 130. This would seem to be particularly true where, as here, the concept employed in the patent is also admitted to be old in the art.

Nevertheless, Sprengel was the first to combine elements in the precise fashion disclosed in '390, and we must determine whether such combination was obvious to a person of ordinary skill in the pertinent art. We think it was. The combination filled a commercial need and has enjoyed commercial success, but those matters without invention

will not make patentability. *Anderson's-Black Rock,* supra, 396 U. S. at 61, 90 S. Ct. 305. The combination resulted in greater convenience and ease of operation but did not produce a "new or different function." *Anderson's-Black Rock,* at 60, 90 S. Ct. 305. Nor are there present here the elements considered in United States v. Adams, supra, and *Anderson's-Black Rock,* supra, of the inventor surmounting skepticism in the art to achieve unexpected results[16] or providing the key requirement or missing link to achieve a desired end. *Adams,* 383 U. S., at 51, 86 S. Ct. 708, and *Anderson's-Black Rock,* 396 U. S., at 60, 90 S. Ct. 305.

In addition, and by way of summary the kingposts, boom, universal joint, topping lifts, and purchase gear are common to Sprengel '390, Lehmann '222, Lehmann '790, Sparrow '403, and Kohnenkamp '193. Use of a fitting attached to the boom or davit, at or near its head, by a round pin or support whose longitudinal axis is perpendicular to the longitudinal axis of the boom or davit in a plane parallel to the plane of the deck, which fitting rotates freely around such axis of the pin or support, and to which fitting is attached the upper purchase block, is common to Sprengel '390, Lehmann '222, Lehmann '790, and Ashe '664; and the fitting at the throat of the fork to which the upper purchase block is attached in Kohnenkamp '193 is remarkably similar, although without precisely the same function. Swinging the purchase gear, like a pendulum, alongside the boom or davit as it traverses dead center is common to Sprengel '390, Lehmann '222, Lehmann '790, Sparrow '403, and Ashe '664. Use of the freely rotating fitting attached to the pin or support at or near the head of the boom or davit to effect

16. This, of course, is not the standard for patentability but its presence is persuasive as to non-obviousness. The fact that it is not conclusive is illustrated by the fact that in *Anderson's-Black Rock* experts testified that they did not believe that radiant heat could be used to solve the problem. The patentee successfully utilized radiant heat but the court nevertheless viewed the patent as obvious.

the pendulum swing through is common to Sprengel '390, Lehmann '222, and Ashe '664. In all events, invention is not claimed for the kingposts, boom, universal joint, topping lifts or purchase gear.

Comparing the claims at issue (see esp. n. 14), *Graham,* 383 U. S., at p. 17, 86 S. Ct. 684, with the prior art, and mindful of the directions in *Graham,* we conclude that any achievement here was that of mechanical improvement utilizing known elements and known concepts and that such improvement was obvious to one reasonably skilled in the art. Improvement over the prior art does not necessarily rise to the dignity of

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invention.[17] Gordon Cartons, Inc. v. Alford Cartons, 218 F. 2d 246, at 250 (4th Cir. 1954). We must never forget that it is a constitutional standard we apply and a strict one at that. *Anderson's-Black Rock,* 396 U. S., at 61, 62, 90 S. Ct. 305. Attempt here is not made to degrade Sprengel's achievements, but what he accomplished in '390 does not rise to the requisite level of inventiveness to entitle him the monopoly jealously guarded by the constitution. We think the following principle from *A & P Tea Co.,* which this court has noted with approval (*Gordon Cartons,* supra, 218 F. 2d at 250), should apply here:

> "A patent for a combination which only unites old elements with no change in their respective functions,

17. See also Inject-O-Meter Mfg. Co. v. North Plains Fertilizer Co., 439 F. 2d 1138, 1142 (5th Cir. 1971):

> "In spite of these and other differences which may amount to improvement over valves of the prior art, in sum all that appellant did was to apply a known valve to an analogous use in a known combination or system. This is not invention. Such advance in the art, if advance there was, merely resulted from that type of activity reasonably to be expected of those mechanically skilled in the applicable art."

such as is presented here, obviously withdraws what already is known into the field of its monopoly and diminishes the resources available to skillful men. This patentee has added nothing to the total stock of knowledge, but has merely brought together segments of prior art and claims them in congregation as a monopoly." A & P Tea Co., supra, 340 U. S. at 152-153, 71 S. Ct., at 130.

The judgment of the district court is Reversed.

WINTER, Circuit Judge (dissenting):

The majority concludes that the elements and concepts of the claimed Sprengel invention were all known prior thereto and that the "invention" was no more than an improvement obvious to one reasonably skilled in the art. Accordingly, Sprengel '390 is held invalid for obviousness. I respectfully dissent.

I.

At the outset, some preliminary comments are in order. First, I am constrained to comment on the breadth of the opinion's consideration of the prior art and to contrast it with the sole ground of obviousness urged on us in this appeal. The majority refers to Ashe '664, Kohnenkamp '193, Lehmann '222, Lehmann '790, and Sparrow '403. Mention of them, as well as technical texts including da Vinci's notebooks, are appropriate to demonstrate the background of the prior art. But, while Prudential-Grace, on appeal, predicates its claim of obviousness solely on Lehmann '222, the majority predicates its conclusion of obviousness on the prior art generally, with a startling lack

of specificity of precisely what in the prior art made the Sprengel invention obvious. Indeed, the variety of the majority's references to prior art suggests to my mind non-obviousness. I fear that the majority has given short change to the proposition that the mere fact that various elements of the Sprengel patent may be found in the prior art is of little significance, because we deal here with a combination patent. It has long been settled that a combination patent may be valid when it represents a new combination of known elements having an effect greater than the sum of the several effects taken separately. Cantrell v. Wallick, 117 U. S. 689, 694, 6 S. Ct. 970, 29 L. Ed. 1017 (1886); United States v. Adams, 383 U. S. 39, 51-52, 86 S. Ct. 708, 15 L. Ed. 2d 572 (1966); Anderson's-Black Rock v. Pavement Salvage Co., 396 U. S. 57, 60-61, 90 S. Ct. 305, 24 L. Ed. 2d 258 (1969); Little Mule Corp. v. Lug All Company, 254 F. 2d 268, 274 (5 Cir. 1958). See Brown v. Brock, 240 F. 2d 723 (4 Cir. 1957). Of course, an appellate court may decide an appeal on the basis of anything in the record whether urged by counsel or not. But in the field of patent law, where our experience teaches us that the professional patent bar generally is in possession of

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more expertise than the average judge who is called upon to decide a patent case, I am loath to decide a case on the basis of contentions not advanced by counsel without, at least, inviting the comments of counsel on what may seem to us to be determinative considerations not advanced in presentation of the appeal. I will therefore direct my attention to the patent in suit and Lehmann '222.

My basic quarrel with the majority is its undertaking to act like a trial court, rather than an appellate court; and in so doing, to do violence to the accepted rules of appellate

view. This is not a case where the district court's factual finding of non-obviousness is clearly erroneous. It is a case where the majority has undertaken a *de novo* factual inquiry into the claim of obviousness. As I shall demonstrate, the proper scope of our review is more constricted than that exercised by the majority.

II.

The Sprengel patent '390 basically describes a cargo boom and gear for the loading and unloading of cargo vessels. The patented boom is unique because it can, without rerigging, service hatches both fore and aft of it. It accomplishes this through two devices. First, the boom is attached to the ship's deck by a universal joint which permits it to swing to the starboard or port sides of the ship, and to swing in an arc from a position pointing toward the bow of the ship to one pointing toward the aft. This particular aspect of the boom is not original. The second and original device is a pendulum block, or blocks, attached to the top of the boom from which hang the boom's cargo tackle and cargo purchase (the ropes, hooks, etc., which are used to lift the load). Since the device at the top of the boom is a pendulum block, the gear hanging from it will always follow a straight drop plumb line perpendicular to the ship's deck regardless of the position of the boom. It is this effect—the perpetual perpendicular position of the cargo tackle hanging from the boom—which permits the boom to be swung fore and aft between the large kingposts without the necessity of rerigging the boom as was necessary on all prior operational booms. The benefit is that the same boom can load fore and aft hatches, alternatively or seriatim, without incurring delays for rerigging, the special delays and dangers of rerigging at night, or the hazards of rerigging in open water or while the ship is

listing. Moreover, the boom is capable of lifting very heavy loads. After its development, the patented boom enjoyed great commercial success. This success has since waned somewhat due to the trend toward containerization.

This patent has the benefit of a statutory presumption of validity, 35 U. S. C. § 282; Prudential-Grace therefore bore a heavy burden of proof to demonstrate invalidity. On appeal, Prudential-Grace's burden is even greater for the determination of patent validity, insofar as it concerns the obviousness and operability of the patent, is a factual issue, committed in the first instance to the district court and reversible only for clear error. Graham v. John Deere Co., 383 U. S. 1, 17, 86 S. Ct. 684, 15 L. Ed. 2d 545 (1966). The clearly erroneous rule, although virtually ignored by the majority, should be applied with special vigor in patent litigation because of the highly technical nature of the facts in issue. See Graver Tank Co. v. Linde Air Prod. Co., 339 U. S. 605, 610, 70 S. Ct. 854, 94 L. Ed. 1097 (1948).

While 35 U. S. C. § 103 states that a patent may not be obtained "if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains," *John Deere*, 383 U. S. at 17-18, 86 S. Ct. at 694, prescribed the proper analysis under § 103:

> While the ultimate question of patent valadity is one of law . . . , the § 103 condition . . . lends itself to

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> several basic *factual inquiries*. Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary

skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of such subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy. (Emphasis added).

See United States v. Adams, 383 U. S. 39, 86 S. Ct. 708, 15 L. Ed. 2d 572 (1966); Note, Subtests of "Nonobviousness;" a Non-technical Approach to Patent Validity, 112 U. Pa. L. Rev. 1169 (1964).

At the trial, all of the prior art recited by the majority was pressed on the district court to sustain the contention that the patent was obvious. The district court analyzed prior art and rejected Prudential-Grace's contentions with respect to each item. In this appeal, defendant's claim of obviousness focuses on Lehmann '222, called the "gallows boom." Not only was this claim rejected by the district court, but it had been considered and rejected by the patent office. See Reynolds v. Whitin Mac. Works, 167 F. 2d 78, 83 (4 Cir.), cert. denied, 334 U. S. 844, 68 S. Ct. 1513, 92 L. Ed. 1768 (1948).

Prudential-Grace's boom was designed to accomplish the same result achieved by Sprengel '390, but Lehmann differed from Sprengel in several structural respects. While the Sprengel boom is a single cylindrical leg-like structure located between two vertical kingposts, the gallows boom is comprised of two cylindrical structures, or two legs, located between the two vertical kingposts and connected at the top by a rigid brace. In the Sprengel boom, the pendulum block and tackle gear is attached to

one or both sides of the boom by a pin which runs through it and the boom. In the Lehmann boom, the analogous block gear is attached to the rigid brace between the two legs of the boom and hangs from it; hence, the "gallows" nickname. Another structural difference of import is the method by which the booms are attached to the deck. The Sprengel boom is attached by a pivotal joint which permits it to swing right and left and fore and aft. The Lehmann boom is connected to a rotary platform and the platform rotates to permit the boom to swing right or left in an 180 degree arc. The fore and aft swing of the Lehmann boom is not accomplished by rotation of the platform.

The district court found that the Lehmann device did not render the Sprengel boom obvious for the following reasons: (1) the method of mounting the boom on the deck differed; (2) it was a two-legged boom; and (3) it was impractical and was never used.

With regard to its first reason, I have no doubt that the district court was partially in error. It mistakenly understood that the fore and aft swing of the Lehmann boom was accomplished by rotation of the platform on which it was mounted. 346 F. Supp. at 1126, 1128. But the district court was correct that, because of its gallow structure, the Lehmann two-legged boom could not be mounted on the deck for universal movement as could Sprengel. Lehmann has a rigid connection between the two legs of the boom and thus it must be mounted on a turntable for movement between port and starboard.

That Lehmann was a two-legged boom is manifest. As a result, it is not susceptible of having pendulum block fittings mounted on either side of the boom, and hence it cannot teach or foreshadow that possibility. It is true that since the Lehmann boom swings fore and aft on a pin which runs through its legs, the cargo purchase which

hangs from the top cross bar of its boom, like the purchase hanging from the Sprengel

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boom, always hangs straight down regardless of the position of the boom. But the Lehmann boom admittedly does not employ Sprengel's novel pendulum gear to achieve this effect. I therefore can find nothing in the Lehmann boom to suggest the structure of the Sprengel boom. To state my conclusion otherwise, I think that the most that can be said is the concept of a boom capable of being swung fore and aft was recognized and attempted in Lehmann, but the mechanical means sought to accomplish this purpose were different from Sprengel and moreover were unworkable.

Coupled with the structural and conceptual differences between Lehmann and Sprengel, which to my mind are sufficient alone to demonstrate that the district court's finding of non-obviousness was not clearly erroneous, the record establishes that Lehmann's boom was generally recognized as impractical. It was never manufactured, sold, or used. It could not, even in theory, lift the heavy loads of which the Sprengel boom is capable. Only one boom prior to Sprengel '390 achieved in actual practice the degree of fore and aft mobility, with ease and safety, that Sprengel '390 achieved. It was a prior Sprengel invention, the fork-type gear. It, however, operated on a different concept—a fact found by the district court and not challenged on appeal—and it was substantially slower and more dangerous than Sprengel '390.

Another indicia of non-obviousness was the skeptical reception which Sprengel '390 received. *Adams,* 383 U. S. at 52, 86 S. Ct. 708. At least one sophisticated purchaser required an undertaking that a proven forklift gear, which

previously dominated the market, would be provided should the new Sprengel device "fail." Significant also is the fact that the Sprengel application was filed in the U. S. patent office in 1964 (a German application was made in 1963), and Lehmann '222, filed in 1959, had issued two years earlier. In the time which elapsed between Sprengel and Lehmann, no other person skilled in the art hit upon the Sprengel concept. Another more important indication was the financial and commercial success which the Sprengel boom received. It virtually superseded all prior booms on new shipbuilding. *Deere; Adams; Reynolds*, 167 F. 2d at 83. Although commercial success alone does not resolve the issue of obviousness, it is nevertheless proper to consider it. Compton v. Metal Products, Inc., 453 F. 2d 38 (4 Cir. 1971), cert. denied, 406 U. S. 968, 92 S. Ct. 2414, 32 L. Ed. 2d 667 (1972). Finally, although obviousness is determined predominantly by examining what the claims in prior patents taught on paper, it is proper to consider whether the claims made in prior patents were ever operational and to discount the inoperable ones. *Adams*, 383 U. S. at 51-52, 86 S. Ct. 708; *Reynolds*, 167 F. 2d at 84. Lehmann '222, the principal basis of defendant's claim of obviousness, has never been used on any ship.

The district court's specific conclusions that "no one . . . prior to Sprengel came up with a pendulum gear for a boom handling 120 tons or heavier loads, capable of servicing two hatches without rerigging" and that "unhesitatingly . . . even apart from commercial success, Sprengel's Patent '390 is valid under . . . Section 103" to me are unassailable under the clearly erroneous doctrine, or as legal conclusions. I think we should affirm that the invention covered by Sprengel patent '390 was not obvious.

III.

In an effort to defeat recovery, defendant has asserted that the Sprengel patent is invalid for failure to recite a necessary structure, that it was not infringed, and that in any event it was misused. The district court concluded otherwise on all issues. Since I disagree with the majority on the basis of its decision, I would be brought to a consideration of these issues, all of which are pressed on appeal. In view of the basis of the majority's decision, however, a

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full expression of my views on these issues would constitute nothing more than an academic exercise. I will therefore content myself merely by saying that I have considered them, and I find no merit in them, so that I cannot concur in the judgment of the majority even on different grounds.

ADDENDUM B.

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346 F. Supp. 1116-17

[1116]

BLOHM & VOSS AG,

Plaintiff,

v.

PRUDENTIAL-GRACE LINES, INC.,

Defendant.

Civ. A. No. 17959.

United States District Court,
D. Maryland.

June 20, 1972.

J. Cookman Boyd, Jr., and Sauerwein, Boyd & Decker, Baltimore, Md.,

[1117]

Francis T. Carr, Douglas G. Brace, C. Stephen Barrett, III, and Kenyon & Kenyon, Reilly, Carr & Chapin, New York City, for plaintiff.

Robert A. Shelton, Baltimore, Md., George J. Harding, 3rd, George A. Smith, and Frank A. Follmer, Philadelphia, Pa., for defendant.

WATKINS, *District Judge.*

GENERAL STATEMENT [1]

1. The Parties and Jurisdictional Aspects

This is an action for patent infringement brought by plaintiff Blohm & Voss AG, a German company having its principal place of business and shipyard at Hamburg-Steinwerder, West Germany. Plaintiff designs and constructs ships and equipment for ships at its yard.

The defendant, Prudential-Grace Lines, Inc. (Grace) [2] is a corporation of Delaware having its principal place of business in New York, N. Y. It operates a shipping fleet, including six ships known as the Santa Lucia class which periodically load and discharge cargo at the Port of Baltimore.

Plaintiff asserts that the heavy lift cargo gear installed on such ships infringes its patent in suit.

Sun Shipbuilding & Dry Dock Company of Chester, Pennsylvania (Sun), constructed the Santa Lucia class of ships and the heavy lift cargo gear installed on them. Sun is obligated to defend, indemnify, and hold Grace harmless on account of any charge of infringement by such cargo gear, including the expenses of litigation, and is paying for the services of defendant's counsel.

The action for infringement is based upon 35 U. S. C. sections 271 and 281. The jurisdiction of this Court is grounded on 28 U. S. C. section 1338(a). Venue is grounded on 28 U. S. C. section 1400(b). Jurisdiction in respect of defendant's counterclaim for a declaration of invalidity of the patent in suit is grounded on 28 U. S. C. sections 2201 and 2202 as well as 28 U. S. C. section 1338(a).

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1. The paragraphs through "Damages and Relief Sought" closely follow the Joint Pre-Trial Memorandum of the parties.

2. The original defendant was Grace Line, Inc. By merger it has become Prudential-Grace Lines, Inc.

2. The Patent in Suit

The patent in suit is U. S. Letters Patent No. 3,236,390 ('390) granted February 22, 1966, based upon patent application Serial No. 403,441 filed October 2, 1964 by H. F. J. Sprengel (Sprengel). Such patent application was a continuation-in-part of Sprengel's then co-pending U. S. patent application Serial No. 361,422 filed April 21, 1964, now abandoned.

The patent relates to ship's loading apparatus broadly referred to as cargo gear. The patent discloses gear comprising a long boom, pivotally mounted on the deck on the centerline of the ship, having boom head fitting(s) carried by the upper (or outer) end of the boom. The upper cargo [3] blocks are carried by such fittings.

The gear may be constructed in two variations—one using a single upper cargo block mounted on the fitting to swing in pendulum movement along one side of the boom, and a double pendulum variation having two upper cargo blocks located on opposite sides of the boom, pendulumly mounted on the fittings.

The patent is entitled to the April 17, 1964 filing date of German patent application St 21,981 in respect of the double pendulum type of the heavy lift cargo gear. The patent is entitled to the October 12, 1963 filing date of German application St 21,185 in respect of the single pendulum type of gear.

The above mentioned United States patent applications were assigned, and the patent was originally granted, to H. C. Stulcken [4] Sohn, also a company of Germany. In early 1966, plaintiff ac-

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3. Variously described as "cargo", "purchase" or "lifting" blocks.

4. In German the "u" has an umlaut, often reproduced in English as "ue". For simplicity, the single letter "u" is used herein, except in direct quotations.

[1118]

quired the business and assets of Stulcken, including the then-pending application S. N. 403,441, upon which the patent in suit was about to be granted. Plaintiff's ownership of the patent has been recorded in the Patent Office. There is no controversy regarding ownership of the patent.

3. The Contentions of the Parties

A. By Plaintiff, Regarding Infringement

Plaintiff contends that claims 1-3, 14, 15 and 18 of the patent are infringed by the heavy lift cargo gear installed and used on the Santa Lucia class of ships.

To the extent that defendant contends that there is no literal infringement of such claims by its cargo gear, plaintiff contends that the structure of such gear achieves the same result in the same way by the same means as the patented invention, and that any structural differences are obvious mechanical equivalents.

Plaintiff contends that the invention has been a commercial success based upon its technological merits. The gear is capable of handling exceptionally heavy loads, up to 250-300 tons. Two hatches (fore and aft) can be served by the gear alternately without dis-mantling or re-rigging the gear. By virtue of mounting the upper cargo block(s) to swing in pendulum fashion on one side of the upper end of the boom, in the case of the single pendulum, or on opposite sides in the case of the double pendulum, the movement of the boom from one hatch to another is simplified, thereby saving time and permitting the use of less skilled workmen. In the double pendulum construction, as is here in suit, two upper cargo blocks are mounted on fittings on opposite sides of the boom head. This additionally and optionally permits using only one upper cargo

block to handle light loads (not exceeding 50% of normal capacity) at twice the normal lifting speed, although this is not disclosed in the specification nor claimed in the patent in suit.

Plaintiff contends that Sun is a real party in interest.

B. By Defendant, Regarding Invalidity

Defendant contends that the claims of patent '390 in suit are invalid on the following grounds:

1. The differences between the claimed subject matter and the prior art are such that the claimed subject matter as a whole would have been obvious at the time the alleged inventions were made to a person having ordinary skill in the art to which said subject matter pertains (35 U. S. C. section 103).

2. The claims in suit are invalid because the specification of the patent in suit does not contain a written description of the alleged invention, and of the manner of making and using it in the full, clear, concise and exact terms required by 35 U. S. C. section 112.

3. The claims in suit are invalid because they fail to particularly point out and distinctly claim the subject matter of the alleged invention (35 U. S. C. section 112); the claims call for structures incapable of performing their purported functions and call for inoperative structures.

C. By Defendant, Regarding Noninfringement

Defendant contends that none of the patent claims in suit is infringed because each of said claims contains claimed structure which is not found in any of defendant's devices which are alleged to infringe.

D. By Defendant, Regarding The Estoppel Defense

Defendant contends that plaintiff knew that the claims in suit were too limited to cover the rigging configuration of defendant's allegedly infringing devices long prior to the allowance of the patent in suit, but failed to seek claims broad enough to read on said rigging configuration and only sought limited claims to implement its efforts to obtain the patent in suit and, therefore, is not entitled to any equitable assistance in construing the claims in suit to read on the allegedly infringing devices and is es-

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topped from asserting said claims against said devices.

E. By Defendant, Regarding Patent Misuse

Defendant contends that plaintiff has misused its United States patent in suit by means of the license agreement with its exclusive United States licensee, MacGregor-Comarain Co., Inc. ("MacGregor"), both viewed alone, and as a part of a worldwide scheme by plaintiff to divide and allocate markets and suppress competition through similar licensing arrangements, all in violation of the anti-trust laws of the United States, in that plaintiff has:

1. Used the patent in suit to require MacGregor to pay royalties on various STULCKEN MASTS which are unpatentable in this country.

2. Used the patent in suit to tie in procurement of services and goods from plaintiff outside the scope of the patent monopoly.

3. Used the patent in suit to impose improper restrictions on the activity of MacGregor outside the scope of patent monopoly.

4. Used the patent in suit to improperly control unpatented products.

5. Imposed territorial and customer restrictions on MacGregor pursuant to a scheme, furthered by the MacGregor license and its other licenses worldwide, to divide and allocate markets for all two-hatch cargo boom equipment, patented and unpatented, and to monopolize the world market for such gear.

6. Bound MacGregor not to question the validity of plaintiff's patents.

4. Damages and Relief Sought

Plaintiff sought an adjudication that the patent is infringed, and an injunction permanently enjoining defendant from further infringement, by either the use of the heavy lift cargo booms installed on the Santa Lucia class of ships and/or future installations, and damages for past infringement. The amount of damages is not liquidated. Plaintiff has, however, agreed that the dismantling of Grace's ships would impose an inequitable hardship, and if it is successful in this case will be content with money damages for past infringement, and an injunction only against new infringing installations.

Defendant seeks an adjudication that the patent in suit is not infringed and is invalid and void. Defendant further seeks a decree that the patent is unenforceable because of plaintiff's alleged acts of misuse and violations of the Federal antitrust laws and that plaintiff is estopped from asserting the patent against the defendant.

Both parties seek an assessment of costs and an award of reasonable attorneys fees.

VALIDITY.

Statutory Provisions

United States Code, Article 35, Section 282. "Presumption of Validity"

> "A patent shall be presumed to be valid. The burden of establishing invalidity of a patent shall rest on a party asserting it."

The burden is a heavy one. Copease Mfg. Co. v. American Photocopy Equipment Co., 298 F. 2d 772, 777 (7 Cir. 1961); Diamond International Corporation v. Walterhoefer, 289 F. Supp. 550, 554 (D. Md. 1968); Grinnell Corp. v. American Monorail Co., 285 F. Supp. 219 (D. S. C. 1967). This presumption is strengthened where two of the three patents relied upon by defendant were made of record by the Examiner, and where the remaining art relied upon by defendant was long known and is less pertinent. Chesapeake & Ohio Railway Co. v. Kaltenbach, 95 F. 2d 801, 804 (4 Cir. 1938); Bowser, Inc. v. Richmond Engineering Co., 166 F. Supp. 68, 75 (E. D. Va. 1958), modified on other grounds, 264 F. 2d 595 (4 Cir. 1959).

Defendant's contention that the patent "slipped through" the Patent Office "like a greased pig", is picturesque but indecisive. Whether a tortuous process before the Examiner, who at last yields without explaining why, strengthens or weakens the presumption, has been ques-

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tioned. Cook Engineering & Electronics, Inc. v. Hickory Foundry and Machine Co., 231 F. Supp. 271, 273 (W. D. N. C. 1964); Aghnides v. F. W. Woolworth Company, 335 F. Supp. 370, 377 (D. Md. 1971).

The "easy course" certainly eliminates any problem of file wrapper estoppel in connection with infringement.

Section 103: "Conditions for patentability; non-obvious subject matter" reads as follows:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Section 112: "Specification" reads as follows:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.
>
> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention. A claim may be written in independent or dependent form, and if in dependent form, it shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim. An element in a claim for a combination may be expressed as a means or step for performing a specified

function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

The Factual Determination of Obviousness

The criteria for the determination of obviousness under Section 103 have recently been reviewed by the Supreme Court in Graham v. John Deere Co., 383 U. S. 1, 86 S. Ct. 684, 15 L. Ed. 2d 545 (1965) where the Court said (pages 17-18, 86 S. Ct. page 694):

> While the ultimate question of patent validity is one of law . . . the § 103 condition, which is but one of three conditions, each of which must be satisfied, lends itself to several basic factual inquiries. Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy. See Note, Subtests of "Nonobviousness": A Non-technical Approach to Patent Validity, 112 U. Pa. L. Rev. 1169 (1964).

HISTORY OF TWO HATCH GEAR

From at least the end of World War II, many efforts were devoted to the development of gear that would permit

one boom to serve two hatches, fore and aft, without re-rigging.[5] Sprengel has certainly been in the forefront of this work.

[1121]

About 1953, Sprengel developed so-called rotary-type gears, in one of which the boom was rotated by hand, and in another of which the head of the boom was mounted for rotation, and the lifting apparatus was hung from the boom head. At about the same time, he designed the so-called Falkenstein gear, which successfully served a fore and an aft hatch, but which required some re-rigging.

After reading an article on the Falkenstein, the owner of the Hansa line contacted Stulcken about the construction of gear of the capacity of at least 120 tons[6] to service two hatches without re-rigging. In return for such an undertaking, Hansa placed with Stulcken an order for an entire ship, contrary to its previously unbroken practice of having its ships built at another yard.

Sprengel worked on this project, first projecting a rotary-type gear, but he did not consider that it could handle loads as heavy as 120 tons. He[7] then conceived the design of the fork-type gear installed on Hansa's M/S Lichtenfels (PX 28; 9C; United States Patent No. 2,914,193, issued November 24, 1959).

This gear had the top of the boom formed in a "Y" or "fork" configuration, and the upper and lower cargo blocks were suspended from the crotch of the fork. When it was desired to swing the boom through the vertical

5. The recent development of containerized vessels, with little or no ship's gear, has slowed down, if not halted, the production of the gear about to be discussed.

6. The largest rotary type built at the time of trial was 70 tons (PX 81).

7. The confusion in the listing in the Patent of two others with Sprengel as inventor will later be discussed.

plane to service a different hatch, the cargo blocks were brought together, a wedge on the top of the lower block fitting into a wedge-shaped claw in the bottom of the upper block, and the "composite block" swung as an "inverted pendulum" through the fork over the top of the boom.

The fork gear was an immediate commercial success, about 120 having been built prior to 1965 (PX 52, 52A); and defendant concedes that this design was a substantial contribution to the art (Tr. 184). In fact, defendant is rather fulsome in its praise of the fork-type gear—so that it may argue that the patent in suit is inferior to it; or at least no better.

There were and are, however, some deficiencies in the fork design. Care had to be taken that the upper and lower blocks were brought snugly together but that this was not overdone; the height and size of the blocks made visibility poor at night; and it was extremely difficult to swing the gear to an opposite hatch under list, or under open sea conditions.

Lehmann United States Patent No. 3,042,222 issued in July 1962, on an apparatus referred to during the trial as a "gallows" rig. It is heavily relied upon by defendant and will later be considered in detail.

Lehmann United States Patent No. 3,107,790 issued in October 1963, for gear having a rotatable boom head. Although cited in the statutory notice, it is not now relied upon in the argument on obviousness. Sparrow (Newport News) United States Patent No. 3,110,403, issued November 12, 1963, also involves the use of a rotary sleeve, and likewise is not being pressed by defendant.

Some eight years later, while on a trip, Sprengel turned his mind to a consideration of possible designs that would be better than the fork-type gear in speed and

ease of operation and safety. The concept of the pendulum block of the patent in suit occurred over a period of five to ten minutes (Tr. 1011) and he completed substantially final drawings of the concept of the single pendulum in two days.[8] The general concept,

[1122]

now apparently simple, was to hang the cargo blocks, pendulum fashion, from the upper end of the boom so that in every position of the boom the cargo blocks would be vertical, whether the boom was swung fore and aft, or laterally.

The initial concept was that of hanging the cargo blocks from only one side of the boom. Such a single pendulum—block gear was successfully installed on the Westphalia.[9] Shortly thereafter, in an endeavor to increase the lifting capacity of the boom, he hung cargo blocks on opposite sides of the boom—the double pendulum. Despite the commercial success of the Fork-Type

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8. Defendant urges that these relatively short periods of time indicate obviousness. The Court would be more inclined to attribute the result to one of those rare "flashes of genius", by a man who had already made substantial contributions through rotary and fork-type gear. In any event, "Patentability shall not be negatived by the manner in which the invention is made." (Title 35, § 103).

Sprengel's explanation is refreshingly simple. When asked if there was any particular event or occurrence which caused him to get started on the patent in suit, he replied:

"A. No, I think not.

"I can never explain—often they ask me, 'How did you come out with the fork type', and now the same way, 'How did you come to this idea?'

"You cannot explain it. You have it, or you don't have it.

"I did know what I could do, and at some moment, I would do it. And before that, there was no solution. That was with the fork type before, and now the same with the pendulum type." (Tr. 1010-1011).

9. Tr. 564-73. PX 42 is the motion picture of the successful testing of this gear.

construction, it was immediately superseded by the Pendulum-Block design.

In the specification of '390, the general nature of the invention is stated:

> "This invention relates to a ship's loading apparatus. It relates particularly to a cargo boom for a ship. It relates more particularly to a cargo boom intended to be installed in through-swinging manner between uprights on a ship's deck to serve hatches both forward and aft of the boom mounting, and it relates still more particularly to a cargo boom of the kind described which has a pendulum purchase block fitting adapted to swing or be swung past the boom in either direction depending upon whether the boom is serving a forward or an aft hatch." [10]

There follows a reference to the fork-type gear and to its "operational shortcomings."

The specification then continues:

> "For the accomplishment of the foregoing objects the present invention provides a cargo boom having at least one purchase block fitting at its upper end which is mounted to swing from side to side of the boom, that is, from forward to aft of the boom and vice versa, as a normal rather than an inverted pendulum, and which is provided with two turning heads each of which carries a guide sheave above the upper end of the boom proper. Specific embodiments of this invention include one in which the purchase block fitting is overhung on its pivot pin alongside the boom, another in which the boom is forked at its upper end with the purchase block fitting being pivotally mounted within the fork structure and thus adapted to swing

10. Col. 1, lines 16-26.

through the boom, and another in which a pair of purchase block fittings are rotatively overhung along opposite sides of the boom.

"In the utilization of the present invention the hauling parts of a purchase tackle are led from a lower purchase block through passages in a novel fitting from which the purchase tackle and purchase block are suspended, to and over guide sheaves on this fitting, and from there either directly to guide sheaves in hollow rotating heads on top of the uprights between which the boom is mounted and between which it swings, or intermediately to another fitting, tackle, and block arrangement similar to the first. From the guide sheaves in the heads on top of the uprights, the hauling parts are led to guide sheaves within the uprights and thence out through

[1123]

slots in the walls of the uprights, going finally to the drums of two cargo winches.

"When the boom is swung back or forth between the adjacent uprights to serve an aft or a forward hatch, the hauling parts are carried over the top of the boom throughout its whole movement as the purchase block fitting is at all times oriented substantially vertically downwardly as a normal pendulum from its pivot point at or very close to the boom's upper end. Thus the hauling parts of the purchase tackle, led over the guide sheaves on the inventive pendulum purchase block fitting as aforesaid, do not interfere at all with the swinging through maneuver." [11]

Figures 1-12 set forth various embodiments of the invention.

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11. Col. 1, line 69—col. 2, line 37.

Claims 1-3, and 14, 15 and 18 are in suit. Claims 1 and 14, set out below, will, in general, suffice.

"What is claimed is:

1) "The combination comprising (1) a ship's deck, (2) a cargo boom disposed above said deck, said cargo boom having an upper end and a lower end, (3) pivot mounting means for said cargo boom disposed between the lower end thereof and said deck, said mounting means permitting rotation of said cargo boom in a vertical plane to swing through between uprights, and (4) a purchase block fitting adapted to have an upper and a lower purchase block and associated purchase tackle suspended from it, said fitting being pivotally mounted on said boom near the upper end thereof in a manner permitting it to swing from side to side thereof as a normal pendulum in the direction of motion of said boom between uprights, and said fitting including guide means extending above the upper end of the boom which is adapted to receive the hauling parts of the purchase tackle and direct each of the same toward an upright.

14) "The combination comprising (1) a cargo boom having an upper end and a lower end, (2) a head pin extending transversely from opposite sides of said cargo boom near the upper end thereof, and (3) a pair of purchase block fittings, each fitting adapted to have an upper and a lower purchase block and associated purchase tackle suspended from it, each fitting being pivotally mounted closely adjacent said cargo boom to swing from side to side of said cargo boom as a normal pendulum with said boom in substantially upright position, one fitting being so mounted on one extension of said head pin and the

other fitting being so mounted on the opposite extension of said head pin, and each fitting including guide means extending above the upper end of said boom in upright position which is adapted to receive the hauling parts of the purchase tackle, and direct the same away from said boom."

Defendant challenges validity on grounds of obviousness and failure to claim an operative structure.

OBVIOUSNESS

In its claim of obviousness, defendant relies upon shear legs, a boat davit, Sprengel's fork-type gear, and Lehmann's gallows-type design as prior art. The patents on the fork-type gear and gallows-type gear were cited of record in the prosecution of the patent in suit. The Lehmann gallows-type gear has never been installed in any vessel.

a. Old fork-type

Defendant expends a substantial portion of the section of its brief relating to obviousness to an argument that the fork-like structures embodied in Figures 10 and 11 of '390 are inferior to the older fork-type structure embodied in patent 2,914,193. Sprengel candidly ad-

[1124]

mitted that it was the patent attorney who suggested that "we take in every variation" (Tr. 1410) and that the new fork rig while not impractical was approaching it. (Tr. 2696-7). However, in the '390 specifications it was asserted that the new fork rig was better than the single pendulum rig "for handling loads in the very high weight ranges",[12]

12. Col. 7, lines 34-35.

but not as suitable when there would be frequent alternations between fore and aft hatches.[13] One other advantage of the "new fork" is that it is not necessary to remove the Flemish (cargo) hook for a swing through maneuver of the cargo boom, and that the cargo purchase can be employed to swing the boom through against an unfavorable trim.

In any event, this "new fork" gear has never been built or installed, and no claim for infringement has been made.

Defendant also strenuously argues that the double pendulum rig is not superior to the old fork rig.

Defendant cites no authority to support the proposition that a new, different and satisfactory way to accomplish a result is not inventive, because a different way had previously existed. Under this approach, if waste had previously been removed from gutters by manual sweeping into shovels, no invention would exist in mechanical removal, by sweepers and/or blowers or vacuum. The old fork gear did a commercially satisfactory job in view of devices then available. It was, however, superseded by the pendulum gear. Were it now, however, necessary, to establish the superiority of the pendulum gear over the old fork, the Court is of the opinion that this has clearly been done.

Defendant's main reliance, over public response, as to the equivalence or superiority of the old fork over the pendulum gear, is upon literature of plaintiff extolling the virtues of all of its gear; rotary, fork or pendulum. Surely defendant would have been unwilling to accept as proof of superiority of the pendulum gear the self-adulatory praise of plaintiff. The pragmatic supersedure of the pendulum over all other gears is the most persuasive proof possible,

13. Col. 7, lines 47-50.

since it is related to business advantages, not advocacy. The advantages of a simple swing through as contrasted with lifting and coupling the upper and lower blocks, and eliminating the Flemish hook, is obvious. Defendant contends that the "modification" of the inverted pendulum in the old fork-type gear to a normal pendulum in '390 is obvious. However, in its brief on infringement (p. 28), defendant argues that a reversal of rotational elements is not an equivalent, citing Blaw-Knox v. Hartsville Oil Mill, 394 F. 2d 877, 883, 884 (4 Cir. 1968).

b. "Shear legs"—Knight's Modern Seamanship

Defendant relies upon plate 44 of Knight's Modern Seamanship (PX 14, PX 16). This old rigging system includes a pair of shear legs supporting a cargo purchase having a pair of upper and lower cargo blocks and an equalizing block between the upper cargo blocks. Fore and aft movement was not contemplated because there are no calculations to show the related stresses. ***There is no pendulum block fitting because there is no boom.***

Bebler, an expert, whose deposition was taken by plaintiff, but who was not employed by plaintiff or its counsel[14] testified to some similarity in approach, the shear legs being the "simplest of elements—a pulley—known from the earliest time of man, to a rather sophisticated bearing-mounted assembly . . .[15] He further testified:[16]

> "A. Most of us live on past experience, and while just for example this PX 14 may be used on shear legs, I personally had never seen it. To the best of my knowledge, we had never used a split load center line system with two

14. PX 123, p. 82.
15. PX 123, pp. 114-115.
16. PX 123, pp. 116-117.

[1125]

winches hauling on it in any of our previous conventional heavy-lift rigging. I have no doubt somebody else thought of it but never developed the hardware to make it a completely useful thing. Once it is accomplished you can say, 'Oh, yes, the Egyptions used this same sort of rig with pulley and block and fall back in the mid-centuries,' so when you are saying it is something obvious, yes, it could have been, but apparently it was not, because it was not generally or well-accepted prior to that time, nor does it fall within my own experience to say that I have seen it tried with good, bad or indifferent results.

"Q. You had seen it tried?
"A. No. * * *

"It is a case of hindsight instead of foresight."

Defendant's expert, Stiglich, admitted that the shear legs device was not directed to cargo handling as such;[17] that the drawing was in error;[18] that he had never seen shear legs used for as much as 80 tons, and that additional blocks would be needed;[19] that the structure was not intended for repeated operation; and that he would not specify its use on ships.[20]

c. Boat davit—Ashe Patent 1,257,664 (PX 2).

Davits may loosely be considered as "devices in the nature of booms or cranes from which a life craft is lowered

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17. Tr. 2020.
18. Tr. 2022.
19. Tr. 2057.
20. Tr. 2059.

by means of cables, or other added lowering means, to the water."[21]

Note the emphasis on "*lowering*". A cargo boom must, however, lower, raise, and transfer.

Sprengel would not characterize Ashe's davit arm as a boom; a cargo boom must not only move up and down, but to port and starboard.[22]

Bebler felt that Ashe's davit had no bearing on the invention in suit. It was designed for special purposes not applicable to heavy lift cargo gear.[23]

Although Stiglich testified that he thought that the pendulum was obvious in view of Ashe, the old fork, and Lehmann '222,[24] he admitted that Ashe was primarily related to lowering;[25] that if the cleat were placed as shown in the patent drawing, it would cause the line to wrap around the "boom";[26] and that a "fair lead" would be required.[27] After some apparent evasion,[28] he finally admitted that the hauling parts of the tackle in the Ashe patent were guided from the top of the davit arm down to another portion of the davit arm, and not guided away from the davit arm.[29] Claim 14 of '390 calls for guide means for directing the hauling parts of the purchase tackle "away from" the boom. While Stiglich referred to having seen one arm of the equivalent of the Ashe davit used, it was only to lift an undescribed load, which was pulled by a tag line to an open lower deck[30]—a far cry from a cargo boom

21. DX 67, p. 9-4.
22. Sprengel, Tr. 273.
23. PX 123, p. 65.
24. Tr. 2262-63.
25. Tr. 2060.
26. Tr. 2085.
27. Tr. 2097.
28. Tr. 2094-97.
29. Tr. 2449.
30. Tr. 2088, 2449.

lifting cargo out of or lowering it into, a hold, and capable of swinging through to service another hatch.

If Knight plus Ashe taught all that was necessary to know to develop a cargo boom to service two holds, no patents for rotary, fork, pendulum or other gears

[1126]

for the same purpose should ever have issued.[31]

d. Lehmann Patent 3,042,222 (PX 36).

This patent, issued on July 3, 1962, on application filed April 13, 1959, relates to the "gallows" boom previously mentioned. It is worthy of more than footnote emphasis that while the preferred structure is mounted on a turntable, Claims 1, 2 and 5 do not refer to a turntable. Compare this with the criticism of Figures 10 and 11 of the patent in suit.

The Court would be inclined summarily to dispose of citation of Lehmann '222 on the contention of obviousness, since at the trial and in argument and briefing it was treated by defendant as a two-legged "boom" mounted on a turntable. The upper cargo block "is *pivotally* mounted at the head of the boom to permit the cargo purchase to swing from one side of the boom when shifting from one hatch to another . . ."[32]

It has been shown that efforts to meet the problem of shifting a cargo boom to serve two hatches without rerigging had been attempted by rotating heads on the tops of booms; by rotating the boom on a pivoted base; and Lehmann '222 adds a turntable to rotate the boom and winches. But the arrangement of Lehmann '222 by which the boom

31. Including that issued to Sperg of Sun, processed by Grace's attorneys, who did not feel obligated to disclose this allegedly completely anticipating art to the Patent Office.

32. Defendant's Brief after trial, p. 33, emphasis added.

and winches are rotated, pivotal mountings being provided to permit the cargo purchase to swing from one side of the boom to the other side in this process, is completely different from the patent in suit, where the boom does not rotate, but moves fore and aft, and the cargo purchase does not pivot or swing from one side of the boom to the other, but pendulates with the fore and aft swing of the boom, always remaining on the same side(s) of the boom.

The processes and concepts are completely different; and while Lehmann '222 may well have been anticipated or at least made obvious by the prior art, this is not true of Sprengel '390.

Defendant seems to be properly sensitive as to the practicality of Lehmann '222, which has never been pragmatically demonstrated.

The Court is fully aware of the rule that the issuance of a patent creates a "presumption" that the structure disclosed is operative. Simmons Company v. A. Brandwein & Co., 250 F. 2d 440, 447 (7 Cir. 1957).

Even if Lehmann '222 were practical, the Court would still be clearly of the opinion that it did not make Sprengel '390 obvious. Despite its reliance on the presumption of operability from the mere issuance of a patent, defendant devotes approximately one-third of its total argument on obviousness to an effort to show that Lehmann '222 *is* operable.

First, it is argued that skepticism as to the attack on operability of the Lehmann '222 patent "should be particularly great" since the patentee was a naval architect "and is known to have actually designed the successful rotary two hatch cargo gear" of United States Patent No. 3,107,790 "which was actually placed on operating vessels of Prudential Lines . . ."[33]

33. Defendant's Brief after trial, p. 35.

However:

(1) The fact that an inventor has one practical invention does not necessarily mean that another patent of the same inventor is operable.

(2) The "successful two hatch rotary gear" is covered by a patent in which the filing date is after the filing date of '222, and its date of issuance is after that of '222. It might just as plausibly (or implausibly) be argued that Lehmann realized the impracticability of the device ultimately covered by '222, and went to a different rig in '790.

[1127]

(3) The "successful rotary two hatch cargo gear" of '790 was installed on only two ships on a "two for the price of one" deal. A rather modest success.

(4) The Lehmann '222 gear has never been installed on any ship.

Second, the gallows rig was listed in a "Cargo Handling Study" prepared by George G. Sharp, Inc., for the Maritime Administration. Although Stiglich had been associated with the Sharp organization, he was not familiar with the calculations, if any, made by Sharp and made no attempt to familiarize himself with them before testifying; and had never discussed the usefulness or feasibility of the gallows-type design prior to his contact with this suit.[34]

Third, defendant discusses at length the testimony as to the practicality, or impracticality, of the Lehmann '222 rig. In this connection some language difficulties were apparent in Sprengel's testimony, in which he stated that he first faced the English word "impractical" in this Court.[35]

34. Tr. 2327.
35. Tr. 2621.

The Court believes it fair to say that his final conclusion was that while an operative gallows-type gear could be constructed, the cost of construction and maintenance of Lehmann '222, as compared with the pendulum rigs, would make the Lehmann '222 impractical from a business or economic standpoint.

Admittedly, rotating platforms can be and have been used for the support of cargo blocks secured to a crosspiece at the upper end of the two parallel sides of a "boom", which do not swing over center.[36] There is no evidence that they have ever been, or could be, used for a 120 ton load.

Sprengel took the position that the boom of Lehmann '222 is deficient due to torque caused by the topping lifts [37] when the boom is trained out and the force in the shorter of the topping lifts has gone to zero. Despite Stiglich's denial that zero force does exist in the Lehmann gear,[38] Sprengel demonstrated its possibility on the electric model of the '390 gear.

Although Stiglich offered detailed computations relating to the gallows design, they did not include many elements, such as three-dimensional forces, torque, deflection, or calculation of the gooseneck design.[39]

The model of Lehmann '222 was built from a sketch prepared by Stiglich, who checked it, and had the wiring [40]

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36. PX 123, pp. 82-93.

37. The topping lifts control the motion of the boom in lowering, raising, and/or going from side to side.

38. Tr. 2235. Stiglich's testimony indicates that because in the United States (contra Germany) calculations are made only on the main outreach, he did not calculate the stresses that would occur if the gear were subjected, unintentionally or advertently, to operation beyond that contemplated in ordinary operations.

39. Tr. 525, 2382, 2409, 2509-19, 2590—Sprengel.

40. The way in which the wire rope is run through the blocks.

changed.[41] As rigged, the gear could be used for light cargo only.[42] Moreover, because of the rotating platform, Lehmann '222 would require the use of separate winches for auxiliary, or lighter cargo, booms.[43]

Were it necessary to choose, the Court would hold that, while at great expense Lehmann '222 could be made workable, it would be definitely inferior to the Sprengel '390 pendulum; a conclusion which it shares with (or is shared by) the shipping industry.

(5) Patent as valid reference irrespective of actual use.

While admitting that the gallows rig of Lehmann '222 has never been used, defendant argues that this does not detract from the effectiveness of the teach-

[1128]

ing of that patent. The short answer is that the use of a rotary table, requiring the turning of the boom by 180° does not teach the use of pendulum gear, and a raising and lowering of the boom fore and aft on a gooseneck.

The cases cited by defendant do support the proposition that a paper patent is relevant on obviousness, but the primary thrust has been where the paper patent was an anticipation. National Filters, Inc. v. Research Products Corp., 384 F. 2d 516, 518 (5 Cir. 1967); Morton v. Ladd, 218 F. Supp. 824 (D. C. D. C. 1963); B. F. Goodrich Co. v. United States Rubber Co., 147 F. Supp. 40, 63 (D. Md. 1956) affirmed 244 F. 2d 468 (4 Cir. 1957). The *Goodrich* case at page 63 and the therein cited cases of Western States Machine Co. v. S. S. Hepworth Co., 147 F. 2d 345, 350 (2 Cir. 1945) and Zephyr American Corporation v. Bates Manu-

41. DX 69; Tr. 2130.
42. Tr. 2156.
43. Tr. 2454.

facturing Co., 128 F. 2d 380, 385 (3 Cir. 1942), dealt only with the use of paper patents for the Section 102 defense of anticipation.

(6) Manner of conceiving the rig.

Defendant argues that "it is evident that the conception of the rig of the patent in suit was not in response to any serious and long unsolved problem",[44] on the ground that the problem of swing through without re-rigging had been "solved" by a number of earlier rigs such as the old fork, and rotary gear. It certainly had not been completely satisfactorily solved, as shown by the fact that the old fork, although highly successful commercially, was immediately superseded by the pendulum gear. The lack of complete satisfaction is shown by the Sperg patent by an employee of Sun, No. 3,286,851, issued November 22, 1966 on application filed November 6, 1964.

Defendant again adverts to the short period involved in the conception and birth of the pendulum rig. While the period of gestation may vary from two years in elephants to nine months in humans to days with fruit flies, this Court has been cited to no authority, and is aware of none, that equates novelty and usefulness with length, or shortness of time. As Sprengel aptly put it, "You either have it, or you don't have it." He had it.

(7) Independent development of three separate rigs.

Defendant contends that "three separate pendulum swing through rigs were developed independent of plaintiff and Mr. Sprengel."[45] This appears to be inconsistent with defendant's immediately preceding contention, noted above, that Sprengel's conception was not in response to any serious and long unsolved problem. If this were a correct ap-

44. Defendant's Brief after trial, p. 49.

45. Defendant's Brief after trial, p. 53.

praisal, at least four persons wasted a very substantial amount of time and money on a non-existent problem.

The three rigs mentioned by defendant are:

(a) A double pendulum gear developed by the East German Warnowwerft yard.

This resembled the double pendulum rig in some respects but the method of fixing the span or topping tackle to the boom differed. The pendulum principle may well have been derived from Sprengel, since Warnowwerft's patent application was not filed until October 1964, while Sprengel's invention was conceived, and the first single pendulum block was sold by Blohm & Voss, in 1963.

Moreover, at the request of Warnowwerft, Sprengel discussed the double pendulum in 1967 or 1968. "They asked us if we could have some agreement."[46] Warnowwerft took a license (DX 25).

(b) Sperg patent No. 3,286,851.

Sperg, a Sun employee, in June of 1964, prepared a sketch of a double pendulum rig. This was abandoned, and the patent issued to Sperg does not have a pendulum fitting.[47] This would seem to the Court clearly to negative obviousness. Sperg's first sketch of double pendulum fitting, and his abandonment thereof, and the securing of a patent for a dif-

[1129]

ferent gear, show that he did not regard the pendulum device as the "obvious" solution to the swing-through problem. Sprengel did.

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46. Tr. 1582-83.

47. Defendant's Brief after trial, p. 56.

Moreover, Sun did not install the Sperg patented gear on the Santa Lucia class, or any other vessel constructed by it.

(c) Stiglich.

Defendant states:

"Mr. Stiglich is the third independent person to come up with the basic concept of the Sprengel invention. He conceived a heavy lift rig with sheaves mounted at the head of the boom which was in principle identical to the Sperg rig as shown in plaintiff's Exhibit 68 (R. 2241-6). Mr. Stiglich's independent conception was approximately the second quarter of 1964 (R. 2241-A)".[48]

What Stiglich in fact said was that in the latter part of 1963 in considering heavy lift gear for an American President Lines, ship, he had experienced difficulty with the Stulcken fork-type boom; the engineering manager for American President Lines was quite disturbed at the forks, which he felt "were ridiculous in some respects". Stiglich did a little study, and "came up with an idea of putting a pin through the head of the boom, and mounting sheaves on it and providing tackle on each side of the boom in the form of a split hoist." He showed the model he had made to Klewsaat of MacGregor in the second quarter of 1964, and showed him "a couple of sketches of the solution to the fork, who then showed drawings for a patent application for the single pendulum rig".[49]

Stiglich then testified that the "idea of the principle" in the Sperg patent was identical to one he had, "in that it had the cross pin through the head of the boom with

48. Defendant's Brief after trial, p. 57.

49. Tr. 2241A.

multiple sheaves and the split cargo hoist" but he had not worked the idea out in as much detail as shown in the Sperg patent.[50]

The importance Stiglich attached to this "idea of the principle" is shown by the fact that he did not retain the sketch, or a copy of it; he thought he might have left it with Klewsaat.[51]

Klewsaat categorically denied ever receiving any such sketch from Stiglich.[52]

Notably, there is no claim by Stiglich that his sketch showed any pendulum gear.

By way of summary, despite shear legs and Ashe, no one (including the designers of rotary heads, rotary booms and rotary platforms) prior to Sprengel came up with pendulum gear for a boom handling 120 ton or heavier loads, capable of servicing two hatches without rerigging.

Unobviousness is further demonstrated by the reaction of those skilled in the art when they learned of Sprengel's invention. Bebler thought the invention was "new and novel".[53]

Hamburg America Line, the purchaser of the first pendulum-block gear, was so skeptical that Sprengel was forced to agree that if the pendulum boom did not operate as represented, he would replace it with a fork-type gear. No replacement was made or demanded.[54]

If the pendulum were so obvious, Sperg's "invention" would have been even more so. Yet Sperg obtained a patent, in the prosecution of which defendant's counsel did not direct the attention of the Patent Office to shear legs and davits—now so heavily relied upon. (Defendant's

50. Tr. 2242.
51. Tr. 2243.
52. Tr. 2717-18; 2723-24.
53. PX 123, pages 53-4, 65.
54. Tr. 576-7.

counsel deny then knowledge of shear legs and davits now relied upon. Defendant's Reply Brief, p. 11).

The case is one in which all the data urged in support of obviousness were available to every one; but only Sprengel came up with a pendulum.

[1130]

Simple as that device may seem in the light of hindsight, it escaped all others. Simplicity, instead of an objection to invention, may constitute its great excellence and value. "It only remains now for the wisdom which comes after the fact to teach us that . . . [Sprengel] discovered nothing, invented nothing, accomplished nothing." Carnegie Steel Co. v. Cambria Ivan Co., 185 U. S. 403, 446, 22 S. Ct. 698, 715, 46 L. Ed. 968. See also Diamond International Corp. v. Walterhoefer, 289 F. Supp. 550, 552-553, 553-554 (D. Md. 1968) and cases cited.

The Court unhesitatingly holds that even apart from commercial success,[55] Sprengel's Patent '390 is valid under the requirements of United States Code, Title 35, Section 103.

Failure of Claims to Recite an Operable Structure

This contention, that the claims of '390 fail to meet the specificity of United States Code, Title 35, Section 112, involves a logical inconsistency with the contention that the patent is invalid on the ground of obviousness. Certainly one "having ordinary skill in the art" would find it obvious not to develop[56] an inoperative structure. If the pendulum gear were obvious, it must be operative.

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55. PX 52 and 52A; Tr. 681-688.

56. The term "develop" is used rather than "invent", because if the structure were inoperative, it would not be "novel" or "useful".

Further, the argument advanced that Lehmann '222 is presumed to be operative merely because the patent issued, even although it had never been used, would apply with even greater force to '390, on which not only has a patent issued, but substantial commercial success has been achieved.

With the authorities cited by defendant that a claim to be valid must recite a structure that is capable of performing its purported function there can be no quarrel. No purpose would be served by citing them, or supplementing them.

Apparently the charge of inoperativeness is limited to claims 14, 15 and 18 which are in terms directed to a double pendulum rig.[57] The charge is primarily directed to the failure of the claims to call for

(a) a single runner, and to define the structure for transferring the runner from one purchase block fitting to the other purchase block fitting by an equalizing sheave arrangement.

To this there are several replies.

(i) Perhaps ad hominem, as drafted and filed by Sun's counsel, Claim 1 of Sperg's application did not claim an endless rope or cross-over sheave; and as allowed does not refer to a cross-over sheave.

(ii) The double pendulum can be operated without an endless rope and cross-over sheave, although it is doubtful if this would be satisfactory in ordinary use.[58]

(iii) Knight clearly shows an equalizing sheave. Old and well-known elements need not be included in claims.

57. Defendant's Brief after Trial, p. 61; except insofar as plaintiff contends that Claims 1-3 are broad enough to cover the double pendulum, in that the fittings are mirror images, and that equalizing means are old and well-known in the art.

58. Tr. 1523-27.

Rohm & Haas Co. v. Roberts Chemicals, 245 F. 2d 693, 697 (4 Cir. 1957).

(iv) This element is adequately disclosed in the specifications and drawings.

Failure to recite:

(b) A structure permitting the upper purchase cargo blocks to move transversely. Admittedly, although the patent discloses a pin fitting permitting this movement,[59] the claims contain no specific reference thereto.

In addition to Rohm & Haas, *supra,* see Proctor & Gamble Manufacturing Co. v. Refining, Inc., 135 F. 2d 900, 906 (4 Cir. 1943).

[1131]

This particular element is not part of the invention and should not (and probably could not properly) have been incorporated in the claims.

SPRENGEL AS PATENTEE AND EMPLOYEE

Defendant contends that the weight of Sprengel's testimony is greatly lessened by the fact that he is not only the patentee of '390, but also is an employee of plaintiff.

The Court observed Sprengel over extended periods of time as a witness. He impressed the Court as one of the most forthright and honest witnesses the Court has seen as a judge or in private practice.

Of the rather nit-picking items cited by Defendant, only one justifies a specific examination. This is the assertion that Sprengel was less than candid in stating the inventors of the old fork patent. In fact, he offered a completely satisfactory explanation of how the patent as issued happened to include the names of three inventors. (Tr. 1437-9).

59. Defendant's Brief after trial, p. 65.

Application was made in Germany for a patent on a rotary rig, of which patent Kohnenkampf, Sprengel and Tietgen were co-inventors. Later an addendum was filed, apparently properly under German law, to add the old fork, the invention of Sprengel only. The combined application was filed in the United States. Later the rotary part was withdrawn, leaving only the fork. By oversight, the names of Kohnenkampf and Tietgen were not stricken.

Application was filed in the Patent Office for a certificate under 35 U. S. C. § 256 and Rule 324 deleting the names Johann Dietrich Kohnenkampf and Hans Peter Tietgen as joint inventors in Patent No. 2,914,193. Counsel for plaintiff have been advised by the Patent Office that the certificate of correction has been approved and will be issued in due course. The change in priority date from February 11, 1954 to April 5, 1954, is clearly non-prejudicial to defendant. It is unnecessary to consider whether the change could have been made in this Court, under Iowa State University Research Foundation v. Sperry Rand Corp., 444 F. 2d 406 (4 Cir. 1971).

The Court finds as fact and concludes as a matter of law that Patent No. 3,236,390, and Claims 1-3, 14, 15 and 18 are valid.

Alleged Misuse of Patent

Having found Patent '390 to be valid, normally the Court would proceed to the question of infringement. However, defendant with more than ordinary vigor and earnestness, urges that the patent is unenforceable because of misuse—conduct with regard to the patent that is beyond the scope of the patent monopoly. If this be true, the patent is unenforceable, however egregious the infringement, until the misuse is purged.

Defendant has standing to raise the misuse defense, even though it it not a licensee. Morton Salt Co. v. G. S.

Suppiger Co., 314 U. S. 488, 493-494, 62 S. Ct. 402, 86 L. Ed. 363 (1942); Rocform Corp. v. Acitelli-Standard Concrete Wall, Inc., 367 F. 2d 678 (6 Cir. 1966); Berlenbach v. Anderson and Thompson Ski Co., 329 F. 2d 782 (9 Cir. 1964); Baldwin-Lima Hamilton Corp. v. Tatnall Measuring Systems Co., 169 F. Supp. 1 (E. D. Pa. 1958), aff'd per curiam, 268 F. 2d 395 (3 Cir. 1959).

The alleged misuses are claimed to be:

1. International patent agreements, violating the anti-trust laws, resulting in an unlawful division and allocation of markets, restraining the foreign commerce of the United States.

2. Requiring MacGregor to pay royalties on unpatented masts.

3. Tying unpatented material and services to the patent.

4. Precluding the licensee from challenging the validity of plaintiff's patents.

Of course, the burden of proof is on the defendant, the proponent of the issue. White Motor Co. v. United States, 372 U. S. 253, 259, 83 S. Ct. 696, 699, 700, 9 L. Ed. 2d 738 (1963). United States v.

[1132]

Grinnell Corp., 236 F. Supp. 244, 248 (D. R. I. 1964); aff'd, 384 U. S. 563, 86 S. Ct. 1698, 16 L. Ed. 2d 778 (1966); Sperry Products, Inc. v. Aluminum Company of America, 171 F. Supp. 901, 936-938 (N. D. Ohio 1959), mod. and aff'd, 285 F. 2d 911 (6 Cir. 1960), cert. den. 368 U. S. 890, 82 S. Ct. 139, 7 L. Ed. 2d 87 (1961).

1. Plaintiff's International Agreements in Violation of the Antitrust Laws Result in an Unlawful Division and Allocation of Markets, Restrain the Foreign Commerce of

the United States and Illegally Insure Plaintiff's Monopoly Position.

In support of these propositions, defendant asserts:

(a) Plaintiff dominates the market.

Confining itself to two-hatch rigs, defendant points out that of the 272 installations of two hatch gear (excluding defendant's gear in issue) 221 have been plaintiff's, or 81%. Of the remaining 51 rigs, 23 are Newport News (Sparrow) rigs, 2 are Lehmann rotary rigs, 20-25 are German gears, and one a Japanese rig. The Lehmann gallows rig has not been installed anywhere.

Of the 79 two-hatch rigs installed in the United States, plaintiff accounts for 54, or 68%, with Newport News (Sparrow) accounting for 23 of the remaining 25.[60]

Several comments are in order:

(i) Two-hatch gear is not the relevant market. United States v. Charles Pfizer & Co., 246 F. Supp. 464, 468-470 (E. D. N. Y. 1965); United States v. Charles Pfizer & Co., 245 F. Supp. 737, 739 (E. D. N. Y. 1965); United States v. E. I. Du Pont De Nemours & Co., 351 U. S. 377, 393, 76 S. Ct. 994, 100 L. Ed. 1264 (1956); United States v. Grinnell Corp., 236 F. Supp. 244, 250 (D. R. I. 1964); Diamond International Corp. v. Walterhoefer, 289 F. Supp. 550, 576-577 (D. Md. 1968).

In fact, the relevant market is heavy lift cargo gear for ships. This includes conventional gear, as well as the rotary head, rotary mast, turntable, bipod, fork and pendulum gears. The owner who contemplates building a ship has an extensive choice. Probably cost and serviceability are the determining factors.

(ii) Sprengel (Stulcken, Blohm & Voss) have been in the forefront of the development of heavy lift gear. It is a

60. PX 81.

reasonable inference that their gear has been selected for its performance. In fact, a pendulum gear was installed on the Transcolorado to serve a single hatch.

(iii) The Buy American requirements as to American subsidized ships (46 U. S. C. section 1155) certainly make the various gears, such as the German Stulcken, truly competitive.

(iv) Conventional and more advanced and specialized gear are alternatives in designing a ship. The differences between their characteristics are less than between cellophane, foil, wax paper, glassine and polyethylene; or between citric, tartaric, fumaric, lactic and phosphoric acids, lemon juice and vinegar; or paper board and molded pulp egg cartons.

Even assuming that two-hatch gear is the relevant market, plaintiff's 68% [61] share of the domestic market is not surprising or improper; plaintiff literally created the market, providing (especially in the fork and pendulum devices) superior gears. Plaintiff lawfully [62] acquired United States patents on the only gear (fork and pendulum types) its licenses ever sold. Both its design and manufacturing quality are superior.[63]

[1133]

Shipowners have specified such gear; e.g. Hansa, Hudson Waterways. The defendant itself specified plaintiff's gear (then the fork-type.).

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61. The 68% does not take into consideration the 12 gear sets on defendant's ships, and another on the S/S Admiral Callahan (PX 173) built by Sun, and which it contends do not infringe. If they do not, they are clearly competitive.

62. See previous discussion of the correction of the erroneous listing of inventors. This cross-cuts defendant's several references in the Misuse section of its brief to the "invalid" fork patent.

63. Bebler, PX 123, p. 47.

Somewhat remarkably, defendant in its 26 page reply brief on validity and misuse, devotes two and one-half pages, but not under the topic of misuse, to the argument that commercial success is not such as to support patentability. While admitting that no sales of the old fork-type have been made since the introduction of the pendulum rig, defendant asserts that the single pendulum is already obsolete, and that no sales have been made of the rigs covered by the '390 patent since May 1967. This is ascribed primarily to the present trend toward containerships; and "orders for other types of gear not covered by the patent . . ." (Defendant's Reply Brief, p. 14).

It would be hard to make a stronger argument that the gear of the patent in suit does not have monopolistic control, or the possibilities thereof. Defendant's argument in this respect also seems inconsistent with the contention that two-hatch gear is the "relevant market".

Defendant cites the "web" of agreements covering the major ship building countries of the world, including agreements with:

MacGregor—Comarian, Inc. (DX 17 and DX 19)

Nissho Company, Ltd. and Lateno Seisakusho and Company Limited of Japan (DX 23)

Warnowwerft Warnemunde of East Germany (DX 25)

Constantine and Co. Ltd. of England (DX 27)

Delta of Yugoslavia (DX 28) and

International MacGregor (IMGO) (DX 29 and DX 30 —expired in 1969).

Defendant contends that these agreements unlawfully divide and allocate the world-wide market for two-hatch cargo gear, by the insulation of each licensee in its own

territory from competition with each other licensee with respect to any mast structure covered in any country by a patent held by plaintiff or one of its licensees. This allegedly eliminates price competition, sustains plaintiff's royalty structure, and restrains the foreign commerce of the United States.

So broadly stated, defendant would seem to attack the validity of more than one territorially restricted exclusive license. Obviously, if plaintiff were large enough, it could operate worldwide independently.

Defendant seeks generally to group these together, as if their contexts, contents and scope were similar. They will be considered in the order listed.

As defendant places principal emphasis on the MacGregor agreement, the only one with a United States corporation, it is interesting to note the origin of this relationship.

The plaintiff builds ships in its yard at Hamburg, and manufactures and installs equipment for such ships, including heavy lift cargo gear of several kinds. It has entered into agreements with various non-German companies for the manufacture, and/or representation as its agents for the sale, of heavy lift cargo gear of its design.

MacGregor is a small company having 25 employees which supplies equipment to the maritime industry. Its primary business is in hatch covers, but it also supplies cargo gear of the conventional type, the bipod type and the fork and pendulum-block types of two-hatch gear of plaintiff's design. MacGregor has no manufacturing facilities of its own. It sub-contracts the manufacture of specially fabricated items and buys standardized parts from others (Klewsaat, Tr. 1613, 1642, 1694; Sprengel, Tr. 841).

Plaintiff's first contact with the United States market for cargo gear was in supplying in 1959 the fork-type

gear for the Del Rio class of ships built in the Avondale yard for the Delta Line (Sprengel, Tr. 1443). MacGregor acted as a sales agent (Sprengel, Tr. 1444). Plaintiff then learned of the "Buy American" Act whereby not only must a ship built under subsidy from the Maritime

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Administration be constructed in a shipyard of the United States, but the equipment installed on it must be produced or manufactured here (46 U. S. C. Section 1155). In fact, the gear supplied to the Delta Line was permitted under a special waiver, and with the knowledge that such practice could not be continued (Sprengel, Tr. 1442-3; 1446; Klewsaat, Tr. 1621-23, 1627; Bebler, PX 123, p. 147).

Later, when the Challenger class was to be built for the United States Lines, MacGregor requested a manufacturing license from plaintiff in order to be able to offer gear of plaintiff's design to shipyards in the United States in view of the Buy American Act (Zeitlin, DX 81, p. 72).

The arrangement between plaintiff and MacGregor started out informally, but was formalized in a 1962 agreement (DX 14, 16; Sprengel, Tr. 1431-2). After plaintiff acquired Stulcken and in view of the expiration by its terms of the 1962 agreement, the current agreement (DX 17, 19) was executed in 1967. Defendant examined Zeitlin and Klewsaat at great length during their depositions regarding the negotiations underlying the 1962 and 1967 agreements, respectively, but did not adduce any testimony of plaintiff conditioning a license on MacGregor's paying money on, or being required to purchase, unpatented goods or services (Zeitlin, DX 81, e.g., pp. 52, 56, 77, 92-93, 117-20, 113-4, 146-9).

(1) The MacGregor agreement (DX 17) grants MacGregor the exclusive right to manufacture and sell, and with

plaintiff's prior written approval to cause to be manufactured and sold, cargo handling gear covered by patents owned by plaintiff and listed in Exhibit A to the agreement. It also grants the right to use any improvements, modifications and new inventions controlled by plaintiff; to make, use or sell in its Territory any patented or unpatented inventions, processes or devices owned or controlled by plaintiff; and to acquire from plaintiff all parts and ancillary equipment required by MacGregor.

MacGregor's "Territory" is defined as the United States of America and its territories and possessions, and Canada and Mexico. This is the area as to which Klewsaat testified that MacGregor could compete effectively (Tr. 1692).

Defendant contends that these grants illegally preclude MacGregor from exporting structures of patents not patented in the United States to another country in which they are not patented. Elliott Co. v. Lagonda Manufacturing Co., 205 F. 152, 157 (W. D. Pa. 1913), aff'd 214 F. 578, 580 (3 Cir. 1914). There the courts held that language in a settlement agreement between competitors operating in foreign countries that one of the parties licensed "to make, use, and sell to others for use throughout the United States" limited its activities to the United States.

The grant of an exclusive license to make and sell a device under patents, trademarks and know-how within a defined area does not of itself constitute a prohibition from selling on a non-exclusive basis outside that area. United States v. L. D. Caulk Company, 126 F. Supp. 693, 707 (D. Del. 1954). Where such prohibition is intended, it can be expressly stated, as in Brownell v. Ketcham Wire & Manufacturing Co., 211 F. 2d 121, 124 (9 Cir. 1954);[64] or implicitly as in the Lagonda cases, *supra*.

64. Also holding exclusive licenses to be valid. 211 F. 2d at 129.

In the MacGregor license, the exclusive rights granted MacGregor in the Territory meant that plaintiff could not, so long as the MacGregor agreement was in effect, grant anyone else the right, or itself exercise the right, to manufacture and sell within that Territory. United States v. L. D. Caulk Company, 126 F. Supp. 693, 706-707 (D. Del. 1954).

The license also includes "the exclusive right for sale of Stulcken Masts manufactured and installed outside the Territory to" owners of vessels, and naval architects and consultants having

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their principal place of business in the Territory. (DX 19, p. 4).

Section 12 provides for a "Commission", as distinguished from "Royalty", dependent upon whether plaintiff manufactures the masts, or only supplies designs for masts, for installation outside of the Territory.

MacGregor has been involved as sales agent with respect to the sale of gear of plaintiff's design to Brazilian and Chilean shipowners. (Tr. 1640-41; DX 81, pp. 210-14; 255-56).

(2) Nissho—Tateno (DX 23).

Defendant correctly characterizes it as a "complex agreement." [65]

It also, much more questionably, describes it as an agreement which restrains trade between Japan and most countries including the United States and unlawfully di-

65. Defendant's Brief after trial, p. 77.

The language is unique, and leaves much to be desired. Sprengel does not understand Japanese; the Japanese did not understand German, and so the agreement was prepared (by an understandably anonymous scrivener) in English.

vides markets affecting the foreign commerce of the United States.

The agreement recites the ownership by plaintiff of certain listed patents and that it has information and data ("know-how") including drawings, plans and specifications for the design, manufacture and installation of the Stulcken mast; that plaintiff is willing to grant and "Nissho wishes to agree to a sales agreement and Tateno wishes to manufacture certain parts of the mast . . .".

Plaintiff appointed Nissho as its agent for the masts covered by the Addendum and the know-how gained by plaintiff, and Nissho agreed during the term of the agreement not to produce, sell or represent any other type of cargo gear. Nissho was given Japan on an exclusive basis, and "Cambodge [sic], China, Indonesia, Laos, Malaysia, North and South Vietnam, Phil*l*ippines, Republic of Korea, Thailand, Union of *Be*rma, and Formosa" on a non-exclusive basis; i. e., Blohm has the right to sell masts or parts thereof direct and/or appoint any other sales representative and/or licensees in these territories.

Nissho was authorized to sell to Japanese shipbuilders and shipowners and to non-Japanese shipowners "in case they build and/or convert ships" by shipbuilders in Japan.

Nissho is not allowed to sell, export or re-export the masts or parts thereof except in Asian countries above recited, and undertakes to impose on "his" customers a condition not to export the masts or parts thereof and shall be liable to Blohm "that none of the customers as indicated . . . above exports the mast previously purchased by Nissho from Blohm respectively Tateno." [sic]

Blohm "authorized Tateno as the exclusive manufacturer of fittings and accessories of the mast in the territory." To the extent that Blohm does not supply fittings and accessories to Nissho, they are to be purchased by Nissho exclusively from Tateno.

Included in the Addendum were all the masts disclosed in all of plaintiff's patents, although no Japanese patents were then held by plaintiff.

Nissho and Tateno asked for licenses to manufacture and sell because of Japan's currency restrictions and the expense of shipping heavy gear overseas into Japan. (Tr. 843-8, 1309, 1493-4)

There is no evidence that Nissho—Tateno were or are involved in the United States in any way, or that any domestic manufacturer was supplying, or attempting to supply, heavy lift gear to the Japanese market.

(3) VEB Warnowwerft, Warnemunde, German Democratic Republic (DX 25).

Defendant devotes six lines of its Brief (pp. 79-80) to this license, asserting that it forbids competition with plaintiff, since it restricts Warnemunde to installations in East Germany by virtue of the limiting grant of paragraph 1 to "new

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construction and for rebuilding in or for the GDR (German Democratic Republic)".

The language quoted by defendant is from Item 1, headed "Subject of the Contract".

Item 2 is headed "Contractual Territory". Paragraph 1 reads as follows:

> "The licensee is given the right to use the license—products according to item 1 in those countries in which the licenser has applied—for and granted protected rights. This use comprising the use and marketing of the subjects of the license. The use of the license products by the licensee in all countries in which the licenser owns no protected rights is unaffected hereby."

VEB had a contract with a French owner who had specified Stulcken masts or equal. Plaintiff had a French patent, and VEB, despite its own patent, asked for a license agreement. A naked license was granted, without technical assistance or know-how; and VEB was not permitted to use the Stulcken name. (Tr. 1516-19).

(4) Constantine & Co., Ltd. (DX 27).

Although listed as part of the "web", this agreement receives not even one line of discussion in defendant's Brief.

Under the agreement, Constantine is appointed sole agent for the Stulcken Mast in the United Kingdom, on a straight commission basis. Different rates of commission are payable on deliveries and license and drawing fees.

The license does not in terms forbid competition.

(5) DELTA Inostrana Zastupstva, Serivisi, Kosignacije, Rijeka, Yugoslavia (DX 28).

Delta is given an exclusive sales agency for Yugoslavia on a straight commission basis, and (not unreasonably) "is obligated to refrain from any competition with B & V . . ."

(6) International MacGregor Organization (DX 29, 30).

Starting as a world-wide exclusive license to manufacture and sell heavy load handling gear on January 22, 1957, it was reduced to "France and the U. S. A." on January 14, 1960, and terminated as of January 22, 1969.

Defendant's only discussion in its Brief (p. 80) is:

> "Similarly the IMGO agreement by implication restricts IMGO's territory to France with IMGO agreeing (Section 5) not to 'benefit by the fact that the Stulcken mast is not protected by patent rights in France.'"

A specific restriction to "France and the U. S. A." does not seem to import, or support, a restriction to France.

The significance, or even the meaning of the statement that IMGO is not to "benefit" from absence of patent protection in France is unexplained.

(b) Division of Markets and Elimination of Competition—Sherman Act, Section 1.

In support of the proposition that an agreement to divide markets is a violation of Section 1 of the Sherman Act, defendant cites United States v. National Lead Co., 63 F. Supp. 513 (S. D. N. Y. 1945), aff'd 332 U. S. 319, 67 S. Ct. 1634, 91 L. Ed. 2d 2077 (1947); United States v. Sealy, Inc., 388 U. S. 350, 87 S. Ct. 1847, 18 L. Ed. 2d 1238 (1967); and Timken Roller Bearing Co. v. United States, 341 U. S. 593, 71 S. Ct. 971, 95 L. Ed. 1199 (1951).

These cases, however, are clearly and controllingly different from the case at bar. In each, the territorial division was the result of an agreement between competitors for a division of markets in the United States. In National Lead, there was a division agreement between three defendants and 19 co-conspirators with respect to titanium oxide and pigments thereof. Of the defendants, Dupont produced 76.5% of composite pigments and National Lead 23.5%. Of pure titanium oxide produced in the United States, Dupont accounted for 46.4% and National Lead 41.5%. The agreements involved the splitting of the whole world, and price fixing.

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Significantly, even in this situation, reciprocal grant of patent rights, for a reasonable royalty, were approved (332 U. S. at 359-360, 67 S. Ct. 1634).

In Sealy, the licensor, substantially owned and controlled by "licensees", was in fact a joint venture of the

licensees. The arrangements for exclusive territories were chargeable to the licensees and were part of an aggregation of trade restraints, including horizontal price fixing and policing of retail policies.

The Court pointed out that the situation was not like "territorial limitations imposed by a manufacturer upon independent dealers as an incident to the sale of a trade-marked product." (388 U. S. at 354, 87 S. Ct. at 1851).

The ramifications of Timken have fortunately been capsulized in Sealy as follows:

> "Timken involved agreements between United States, British and French companies for territorial division among themselves of the world market for antifriction bearings. The agreements included fixing prices on the products sold in the territory of the others; restricting imports to and exports of the United States, and excluding outside competition . . ." (388 U. S. at 354, 87 S. Ct. at 1851).

Here, of the six alleged "web" like agreements, only VEB could even arguably be said to restrict manufacture among competitors; and if so construed, there is no showing how it could have affected foreign commerce to or from the United States.

The restrictions in the various agreements seem only to be the exercise by a patentee of his right either to decline to practice its invention; to practice it exclusively itself; to grant a single license or exclusive licenses with or without cross-licensing (Sperry Products, Inc. v. Aluminum Co. of America, 171 F. Supp. 901 (N. D. Ohio, 1959) aff'd and mod. 285 F. 2d 911, 925-926 (6 Cir. 1960);[66] cert. den. 368 U. S. 890, 82 S. Ct. 139, 7 L. Ed. 2d 87 (1961), or to grant non-exclusive licenses.

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66. Cited five times by plaintiff in its Brief after trial, with no rebuttal by defendant.

The factual situation is equally destructive of defendant's argument.

Heavy gear of the type in question cannot, except in exceptional circumstances, be manufactured except at or adjacent to the shipyard in which is being built the ship in which it is to be installed. With American labor costs, and cargo rates (Tr. 845) such gear, patented or unpatented, could not competitively be manufactured in the United States for installation in Europe or Japan.

Neither Newport News nor the Lehmann rotary gear has ever been exported (Tr. 1692).

The Buy American Act is applicable to substantially the entire United States market for heavy gear. It alone would serve to exclude heavy gear manufactured outside the United States, regardless of the provisions of license agreements.

(c) Monopolization and Attempt to Monopolize—Sherman Act, Section 2.

On monopolization, defendant reiterates its figures as to the percent of the market (on two-hatch gears) attained by plaintiff previously made under (a) above. No further discussion seems required or justified.

Based upon its unproved contention of monopoly, defendant contends that from this an intent to monopolize may be inferred. Apparently abandoning this approach, defendant concludes this "point" with the conclusory allegation that plaintiff "has employed its patents through a world-wide web of agreements, the net effect of which has been an illegal restraint of trade and monopolization under Sections 1 and 2 of the Sherman Act and a misuse of the patent in suit."[67] Section (c) ends on the words with which it began.

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67. Defendant's Brief after trial, p. 87.

In-between, defendant cites and relies upon United States v. Du Pont, *supra;* United States v. Grinnell Corp., 236 F.

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Supp. 244 (D. R. I. 1964), aff'd 384 U. S. 563, 86 S. Ct. 1698, 16 L. Ed. 2d 778 (1966); International Boxing Club v. United States, 358 U. S. 242, 79 S. Ct. 245, 3 L. Ed. 2d 242 (1959); and American Tobacco Co. v. United States, 328 U. S. 781, 66 S. Ct. 1125, 90 L. Ed. 1575 (1946). In each of these, as in Du Pont, there had been concerted action by companies previously in active and open competition. They are not, and: ". . . are not comparable to cases where the parties, for example, merely have made a new discovery or an original entry into a new field and unexpectedly or unavoidably have found themselves enjoying a monopoly coupled with power and intent to maintain it . . ." (328 U. S. at 786, 66 S. Ct. at 1128).

(d) Patent Pool.

Defendant contends that the cross-licensing provisions in the MacGregor and Nissho-Tateno agreements are illegal "grant-back" provisions, citing United States v. National Lead Co., 63 F. Supp. 513 (S. D. N. Y. 1945), aff'd 332 U. S. 319, 67 S. Ct. 1634, 91 L. Ed. 2077 (1956) and United States v. Associated Patents, Inc., 134 F. Supp. 75 (E. D. Mich. 1955); aff'd per curiam, 350 U. S. 960, 76 S. Ct. 432, 100 L. Ed. 834 (1956). Neither is helpful to defendant, and National Lead is harmful.

In National Lead, the Supreme Court upheld, against attack by the Government, provisions of the decree permitting National Lead and Du Pont to grant licenses "conditioned upon the reciprocal grant of a license by the applicant at a reasonable royalty . . ." (332 U. S. at 359, 67

S. Ct. at 1653) then "issued or pending, or issued within five years from" the date of the decree. (332 U. S. at 360, 67 S. Ct. at 1653).

In Associated Patents, the formerly competitive defendants had organized a patent holding and licensing company, in which were pooled existing and future patent rights, and each defendant had allocated to itself the exclusive right to manufacture and sell certain specified tools.

On the other hand, cross-licensing or even more, has been approved.

In Transparent-Wrap Machine Corp. v. Stokes and Smith Co., 329 U. S. 637, 645, 67 S. Ct. 610, 91 L. Ed. 563 (1947), the Supreme Court held that an agreement licensing[68] machine patents then owned or later acquired by the licensor, could properly contain a provision not merely requiring the licensee to cross-license the licensor, but requiring the licensee to *assign* to the licensor any improvement patents developed by the licensee.

In Sperry Products, Inc. v. Aluminum Co. of America, 171 F. Supp. 901 (N. D. Ohio 1959), aff'd and mod. 285 F. 2d 911 (6 Cir. 1960), cert. den. 368 U. S. 890, 82 S. Ct. 139, 7 L. Ed. 2d 87 (1961), the Sixth Circuit found no misuse of the patents in suit as a result of a provision for licensing and cross-licensing of foreign patents (285 F. 2d at 925-926).

In Binks Manufacturing Co. v. Ransburg Electro-Coating Corp., 281 F. 2d 252, 259 (7 Cir. 1960), cert. den. 364 U. S. 926, 81 S. Ct. 353, 5 L. Ed. 2d 265 (1961) the Court found no illegality in a license requiring the licensee to assign to the licensor a royalty-free, non-exclusive license with right to sub-license, patents developed by the licensee.

It, therefore, is unnecessary to consider, although it should be noted, that the parties construe the MacGregor

68. Coincidentally, the territory licensed was the United States, Canada and Mexico—the same as that licensed to MacGregor.

agreement to obligate MacGregor to grant only a royalty-free, non-exclusive grant-back to the plaintiff for use only in its own yard, and limited to the subject matter licensed to MacGregor.[69] Should MacGregor develop an improvement, negotiations would be necessary before plaintiff could extend rights thereunder to any of plaintiff's other licensees (Tr. 1647). Neither MacGregor nor any other

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licensee of plaintiff has made any such improvement.[70]

Various additional provisions of the MacGregor Agreement—re Misuse.

(a) Defendant contends that paragraph 11 of the MacGregor Agreement (DX 19) requires the payment of a "royalty" on all Stulcken masts manufactured and installed in the "Territory". Zenith Radio Corporation v. Hazeltine, 395 U. S. 100, 135-139, 89 S. Ct. 1562, 23 L. Ed. 2d 129 (1969) is relied upon as establishing the illegality of this provision. In that case, however, the Supreme Court made it abundantly clear that what it was condemning was "*conditioning* the grant of a patent license upon payment of royalties on products which do not use the teaching of the patent . . ." (p. 135, 89 S. Ct. p. 1582; emphasis supplied).

This qualification—conditioning—is repeatedly stated.

For example, in approving the injunction granted by the trial court, the Court said:

". . . The injunction reaches only situations where the patentee directly or indirectly 'conditions' his license upon the payment of royalties on unpatented

69. Sprengel, Tr. 1461-63, 1477-78; Klewsaat, Tr. 1646-47.
70. Sprengel, Tr. 1464, 1477-78; Klewsatt, Tr. 1646.

products—that is, where the patentee refuses to license on any other basis and leaves the licensee with the choice between a license so providing and no license at all . . ." (p. 135, 89 S. Ct. 1583).

The word "condition" is used again in pages 136 and 137; and "conditioning" on page 138.

The Second Circuit has taken the above language as controlling. In Glen Manufacturing Inc. v. Perfect Fit Industries, Inc., 420 F. 2d 319 (2 Cir. 1970); cert. den. 397 U. S. 1042, 90 S. Ct. 1365, 25 L. Ed. 2d 653 (1970), plaintiff had sued defendant under a licensing agreement under which defendant agreed to pay plaintiff a royalty of ten cents on each toilet tank cover made or sold by it. Defendant contended that this applied only to toilet tank covers within the scope of the patent. Plaintiff contended that the agreement contemplated royalties on all toilet tank covers manufactured or sold by defendant, whether or not they were included within the scope of the patent. The trial judge agreed with plaintiff's construction, but held it fatal to enforceability as amounting to patent misuse.

A few days after the trial court's decision, the Supreme Court handed down its decision in *Zenith, supra.* The Second Circuit remanded the case "for further findings on the issue of 'conditioning' and an explicit determination of whether the license agreement amounted to patent misuse under *Zenith.*" (420 F. 2d at 321).

There is no evidence, or proffer of evidence, in this case that the MacGregor or any other agreement was "conditioned" upon the payment of "royalty" upon unpatented material. Nor is there any evidence that MacGregor, defendant, Sun or any one else asked for and was denied a license under '390 alone.

It is also at least arguable that the MacGregor arrangement is valid under Automatic Radio Manufacturing Co. v. Hazeltine, 339 U. S. 827, 833-834, 70 S. Ct. 894, 94 L. Ed. 1312 (1950). There the Court held that a provision that in return for a license by Hazeltine to use any patent (of which there were 570, with 200 applications) or future development in consideration of a royalty on all radio receivers manufactured by the licensee, regardless of whether or not any of Hazeltine's patents were used, was valid. The Court felt that "sound business judgment" might lead to this method as the "most convenient method of fixing the business value of the privileges granted by the licensing agreement." The licensee was not required to use any of the patents, but was free to use any and all.

Here the so-called "royalty" payable by MacGregor was a combined fee for the license of United States patents and foreign patents; a world-wide indemnity against infringement liability; a trade-

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mark license; and the furnishing to it of substantial know-how and technical assistance.

From a practical aspect, MacGregor had never, under the 1962 or the 1967 agreement (DX 17 and 19) been requested to build or built any licensed gear which is not patented in the United States; and has never paid any "royalty" or fee to plaintiff in respect of the rotary (Type A) gear (Tr. 1653).

3. Tie-In of Materials and Services.

Defendant contends that Paragraph 4E of the MacGregor license (DX 17) improperly "ties unpatented prod-

ucts, drawings and services to the patent in suit." [71] Paragraph 4E reads as follows:

> "Licensee shall not be entitled to use any components or ancillary equipment of a Stuelcken Mast, whether patented or unpatented otherwise than in connection with a Stuelcken Mast. Licensee shall, however, be entitled to use non-patented components or ancillary equipment for a Stuelcken Mast for similar type of cargo gear, always provided, however, that Licensee shall be obligated to obtain the necessary drawings from Licensor for those not patented components or ancillary equipment against payment for the drawings provided by Licensor."

Defendant freely admits [72] that Paragraph 4E is ambiguous. It further argues that Paragraph 6A requiring MacGregor to comply with plaintiff's instructions, practices, and procedures as to design, manufacture and installation of Stulcken Masts, subject to deviation with consent, requires MacGregor to accept engineering and other services from plaintiff. Defendant seeks to analogize these provisions to Morton Salt Co. v. Suppiger Co., 314 U. S. 488, 62 S. Ct. 402, 86 L. Ed. 363 (1942); Columbus Automotive Corp. v. Oldberg Manufacturing Co., 387 F. 2d 43 (10 Cir. 1968); and National Foam System v. Urguhart, 202 F. 2d 659 (3 Cir. 1953); and further refers to instances in which MacGregor has obtained engineering services and drawings from plaintiff.

Admittedly, while MacGregor has acquired knowledge from which it could (probably) satisfactorily do the necessary engineering work and designing for ordinary modifications on Stulcken Masts, there are two clearly established

71. Defendant's Brief after trial, p. 92.
72. Defendant's Brief after trial, p. 93.

aspects. First, plaintiff has an understandable pride in, and concern for, the preservation of its reputation for the finest in cargo masts. Secondly, MacGregor sometimes buys drawings from plaintiff because it does a good job on a competitive price, saving MacGregor the effort of re-assigning personnel on its limited staff.[73] Plaintiff's charges for its drawings are negotiated upon the basis of what is required, the estimated engineer and draftsmen hours required, and the hourly charge rates for the type of work used by plaintiff in making drawings for its own use (Sprengel, Tr. 835, 838-9, 1339-45; 1351-52; Klewsaat, Tr. 1634-36; 1761-65).

MacGregor is not obligated to buy parts from plaintiff, nor could it do so (ordinarily) on subsidized ships under the Buy American policy. It normally sub-contracts the manufacture of especially fabricated equipment; and buys off-the-shelf component parts from others in the United States (Klewsaat, Tr. 1636, 1642-45, 1702; Sprengel, Tr. 1467-68).

MacGregor is not, in practice, nor by the express terms of the agreement, as construed by the parties, obligated to buy drawings or anything else (Klewsaat, Tr. 1635-36). Section 4C expressly limits payment for drawings to those supplied at MacGregor's request.

Again, there is no evidence of the conditioning of the grant of a license under the patent in suit upon the purchase of drawings or parts from plaintiff.

4. Barring the Raising of the Validity of the Patent in Suit is a Misuse.

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Finally, defendant contends that the provisions in the MacGregor and Nissho-Tateno agreements that the licen-

73. MacGregor does not pay for drawings furnished for purposes of bidding on new jobs unless the bid is accepted.

sees may not contest the validity of the patent in suit is, under Lear v. Adkins, 395 U. S. 653, 89 S. Ct. 1902, 23 L. Ed. 2d 610 (1969) "a misuse".[74]

In defendant's Brief after Trial, thirteen lines were devoted to this contention; and plaintiff's Reply Brief devoted seven lines to it.

In this Court's opinion, these treatments were consonant with its relative (un)importance. Lear certainly held that a licensee was not, by virtue of a license, estopped to raise the question of invalidity of the patent when sued for infringement. *A fortiori*, clauses specifically negating this right are invalid. Lear expressly overruled Automatic Radio Manufacturing Co. v. Hazeltine Research, Inc., 339 U. S. 827, 70 S. Ct. 894, 94 L. Ed. 1312 (1950). While this Court has some difficulty in following the Lear Court's reference to Hazeltine as "being itself the product of a clouded history",[75] it is of course bound by the holding.

To this Court it seemed elementary that the decision in Lear struck down the enforceability of the noncontestability provisions in the MacGregor and Nissho-Tateno agreements, as of and from, June 16, 1969, the date of the Lear decision. It did not seem possible to this Court that the striking down of a previously validated provision could invalidate such a contract in toto, particularly in view of the separability claims in each such agreement.[76] More-

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74. Defendant's Brief after trial, pp. 97-98.

75. One of the two reasons expressly stated as the grounds for certiorari in Hazeltine was the question of estoppel of a licensee to question validity (339 U. S. at 830, 70 S. Ct. at 895). While this Court does not question the propriety of the decision in Lear (and it would be immaterial if it did), the flat holding in Hazeltine will, for the reasons to be stated in the text, be of significance.

76. MacGregor, DX 17, Section 18B; Nissho-Tateno, DX 23, Section XVIII, second paragraph. Each agreement is for a five-year term.

over, it did not seem to this Court that any action was necessary on the part of the contracting parties. What could be served by them formally stating: "We agree"; or "We accept and agree to be bound by the supreme law of the land."?

However, in argument, it appeared that defendant's position was not clear. This Court therefore addressed a letter to counsel for plaintiff and defendant, requesting a clarification of positions.[77] From the response it clearly appeared that defendant took the position that the non-contestability clauses rendered the entire license agreements void *ab initio*. There followed the (to the court) somewhat illogical argument that failure by plaintiff to "act" after Lear is a separate ground for finding misuse. Defendant took the position that the "defect" could be "cured" . . . "either by a new agreement or by a written agreement striking the offensive limitation". Apparently defendant contends that the defect (and unenforceability) continues until a "cure" has been effected in one of these two ways.

No authority has been cited by defendant in support of its position that some written step is necessary. To this Court, the effect of Lear is the invalidating of the incontestability clauses, the same as if lines had been drawn through them, or they had been erased or physically excised. Lear did not have to deal with our specific issue, as the restraint was implied from the relationship of licensor-licensee. But the Court did not hold that the license agreement was thereby invalidated, but it permitted non-payment of royalties during litigation, and stated that defendant would not have to pay royalties accruing after the attached patent issued "if Lear can prove patent

77. Copies of the Court's letter of November 30, 1971, and of the joint reply of January 8, 1972, are filed as part of the record.

invalidity." (395 U. S. at 674, 89 S. Ct. at 1913). Implicit in this is the right to collect royalties if the patent were held

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to be valid. And see Plastic Contact Lens Co. v. W. R. S. Contact Lens Laboratories, Inc., 330 F. Supp. 441 (S. D. N. Y. 1970), and Kraly v. National Distillers and Chemical Corp., 319 F. Supp. 1349 (N. D. Ill. 1970).

Defendant has no license; has paid and is paying no royalty; and despite the MacGregor incontestability clause was and is free to contest, and as this litigation shows, is vigorously contesting validity; and did so before Lear was decided.

In other fields the courts have had no difficulty in upholding the validity of the balance of a contract which contained a clause valid when made, but later declared to be invalid.

This has been applied in the field of restrictive covenants. In Terry v. Elmwood Cemetery, 307 F. Supp. 369 (N. D. Ala. 1969) the Court held that a provision in cemetery lot deeds limiting interment to Caucasians was void and of no legal effect. The Court did not, however, void the deeds, and gave no intimation that any or all of the deeds had to be physically rewritten or amended, or that confirmatory deeds either striking out or omitting the voided language were necessary. It merely declared that the limitation provisions in the lot deeds "are void and of no legal effect."

In Re Port Publishing Co., 231 N. C. 395, 57 S. E. 2d 366, 14 A. L. R. 2d 842 (N. C. 1950) a collective bargaining agreement contained clauses relating to vacation and severance pay, wages, hours, overtime, vacations and closed shop—all valid when the agreement was made. Later the closed shop provision was outlawed by the North Carolina

Legislature. In receivership proceedings the remaining provisions were held to be valid and enforceable. There was no reference to need for excision or reformation.

In National Labor Relations Board v. Rockaway News Supply Co., Inc., 345 U. S. 71, 73 S. Ct. 519, 97 L. Ed. 832 (1953) the agreement in question contained no-strike, arbitration and union security clauses, all valid at the time they were inserted. An employee was discharged for violation of the no-strike clause. The Adjustment Board provided for in the Agreement found against the employee. He then filed a charge of unfair labor practice with the National Labor Relations Board, which found in his favor and ordered his reinstatement. In the meantime the Union security clause had been held to be invalid. The Board held that this made the entire agreement "utterly null and void" (p. 76, 73 S. Ct. 519).

The Supreme Court reversed, holding that there were two obstacles in the way of the Board's complete disregard of the contract. First, that even "if inclusion of a forbidden provision is enough to justify the Board in setting it aside as to the future, it does not follow that it can be wholly ignored in judging events that occurred before it was set aside."

Second, the objectionable feature could be severed, particularly in view of the contract's separability clause. In dealing with this, the Court said in part:

> "The employment contract should not be taken out of the hands of the parties themselves merely because they have misunderstood the legal limits of their bargain, where the excess may be severed and separately condemned as it can here." (p. 79, 73 S. Ct. 524)

Substitute "license agreement" for "employment contract", and bearing in mind that misunderstanding "the

legal limits of their bargain'' required the overruling of a Supreme Court case directed expressly to that point, the above quotation is unusually apt.[78]

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Defendant has failed to prove misuse by plaintiff of the patent in suit, or of plaintiff's patent position.

INFRINGEMENT

The accused gear is found on six ships of the defendant Grace, of the Santa Lucia class. Five of the ships each have one 80-ton and one 30-ton gear. The sixth has two 80-ton gears.

The infringement problems from a comparison of the accused devices will separately be considered with respect to the 80-ton and the 30-ton gears. Consideration will also be given to the extent, if any, by which the structures of the accused gears have been influenced by knowledge or information of the gear covered by '390. Finally, the significance of Sun's and Grace's appraisal of the accused gear vis-a-vis the Sprengel gear will be considered.

I. *Structure and Operation.*

1. The structure of the 80-ton gear is identical to that of the double pendulum gear of '390 with the following exceptions:

(a) In Sprengel's gear the purchase tackle is led by hauling tackle guide means extending ''above the upper

78. Somewhat analogous is Compania De Inversiones Internacionales v. Industrial Mortgage Bank of Finland, 269 N. Y. 22, 198 N. E. 617, 100 A. L. R. A. 1313 (New York, 1935). Dollar bonds of a foreign corporation payable in this country in gold coin had been called for redemption. The Court held that unenforceability of the clause requiring payment in gold did not invalidate the bonds, but that the holder was entitled to payment in legal tender.

end of the boom" to the top of the kingposts, down through the kingposts and thence to the purchase winches.

In the accused structures, the purchase tackle is led from guide sheaves below the topping tackle and below the head of the boom to points near the upper ends of the kingposts and thence downward outside the cargo posts to the purchase winches.

Certain collateral advantages are (as expected) claimed with respect to whether the purchase tackle is led down through or outside of the kingposts. Advantages of having the purchase tackle go down through the kingposts are that the tackle is (largely) protected from sea water and that its emergence from the kingposts can be effected at any point, thus affording almost unlimited selection in the location of the winches on the deck or deck house; or the winches can be located entirely within the kingposts.

In favor of conducting the purchase tackle entirely outside the kingposts it is argued that the tackle is always visible and open for inspection; and that more conventional and cheaper guide blocks can be used.

Were the Court required to choose between these particular features, it would pick the Sprengel locations as more desirable. However, it is not necessary to choose, as the invention relates to the swing through, and not to the disposition of the purchase tackle after it leaves the boom.

Although the claims in suit refer to purchase tackle guide means extending "above the upper end of the boom", it was not, as defendant urges, necessary that this be inserted in the patent application as a limitation in order to secure the issuance of the patent. This is not a case in which claims were rejected because they called for purchase tackle guide means extending below the upper end

of the boom, or for failure to specify their location. The claims were granted as originally filed, and there is no file wrapper estoppel.

Nor would the location of the purchase guide means above the upper end of the boom have been of itself a patentable element or ground of distinction. This was already employed in the Fork-type gear of Sprengel.

The Newport News and Lehmann designs had the cargo hauling (purchase) rope running underneath the topping tackle (PX 26, 32, 34).

It was well-known before 1964 that the cargo hauling parts could be satisfactorily installed either above or below a split topping lift.[79]

The testimony on behalf of plaintiff was that guiding the hauling parts below the topping lift accomplishes the same result and functions in the same

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way as if placed above. It is simply a matter of the designer's choice.[80]

That the "above" or "below" location is not critical is impressively manifested. As a result of conflicts as to whether or not heavy lift gear for the Grace ships had been agreed upon, and if so, what it was, a conference was arranged for March 17, 1965, between Sun, Grace, and Gibbs & Cox, Grace's naval architects. Menko[81] of Gibbs & Cox prepared for and distributed at the meeting a detailed com-

79. Bebler, PX 123, p. 80.

80. Sprengel, Tr. 762, 765, 775, 781-2; Bebler, PX 123, pp. 78-80. This "choice" however, is restricted as to '390 to the double pendulum gear.

81. Employed by Gibbs & Cox in its hull outfitting division, and in charge of that division since about 1958.

Gibbs & Cox was a well-known firm of Naval Architects, acting for Grace.

parison, with comments, of the features of heavy lift cargo gear according to the designs of Sperg, the Fork-type gear, and Sprengel's pendulum block invention. The columnar comparison (PX 69B) lists the various elements of heavy lift gear, with a commentary regarding the differences between them. Nowhere is there any mention of, or comment with respect to, where the lead lines of the cargo hoist were with respect to the toppings—above or below; or as to where they must, or preferably (if there be a preference) should be.[82]

Defendant argues that:

> "Not only is defendant's guide structure different mechanically and in its operation, but . . . this was recognized by the Patent Office when it granted the Sperg patent (PX 68)"[83]

Defendant then refers to and quotes from an argument made on behalf of Sperg, pointing out that in his application the hauling parts lie below the topping lift, and do not go into the kingposts.

In this conection it must be remembered:

(i) Defendant's counsel admits that the Sperg patent should not have been granted.[84]

(ii) Whether or not arguments made in the course of the prosecution of a patent are admissible,[85] their relevance here is not obvious. The Sperg patent has never been used!

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82. Menko, PX 125, pp. 223-24; 329.

83. Defendant's Brief after trial, p. 29.

84. Tr. 196.

85. Denominational Envelope Co. v. Duplex Envelope Co., 80 F. 2d 186, 192-193 (4 Cir. 1935).

(b) In Sprengel's rig (Fig. 6 of '390) the purchase tackle hauling parts are guided by a sheave mounted on a turning head which rotates only on a substantially vertical axis. The purchase tackle then passes through an opening up to and across the equalizing sheave.

Defendant employs a universally mounted fair lead [86] for each part of the purchase tackle.

(c) Although the claims do not so require, the pendulum blocks of '390 are independently mounted in practice.

In the Sun rig, the pendulum blocks are jointed together in a "cradle" and cannot move independently. Again, each side claims virtues. Defendant claims its rig is simpler and cheaper.[87] Plaintiff claims that defendant's rig is dangerous.[88]

Merging two elements into one unitary structure would not avoid infringement. Specialty Equipment & Machinery Corp. v. Zell Motor Car Co., 193 F. 2d 515, 518 (4 Cir. 1952); imperfect practice of an invention is still infringement. Admiral Corporation v. Zenith Radio Corporation, 296 F. 2d 708, 717 (10 Cir. 1961); and an improvement may still infringe. Acme Steel Company v. Eastern Venetian Blind Co., 130 F. Supp. 459, 466 (D. Md. 1955); aff'd 227 F. 2d 914 (4 Cir. 1955).

In this Court's opinion the 80-ton gear of the defendant, although differing in some physical aspects from that of patent '390 is its equivalent, since it "performs substantially the same

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function in substantially the same way to obtain the same result." Sanitary Refrigerator Co. v. Winters, 280 U. S.

86. Guide.
87. Tr. 2281.
88. Tr. 363-7.

30, 42, 50 S. Ct. 9, 13, 74 L. Ed. 147 (1929). The Court continued:

> ". . . Authorities concur that the substantial equivalent of a thing, in the sense of the patent law, is the same as the thing itself; so that if two devices do the same work in substantially the same way, and accomplish substantially the same result, they are the same, even though they differ in name, form, or shape".

Accord, Wine Ry. Appliance Co. v. Baltimore & O. R. Co., 78 F. 2d 312, 318-319 (4th Cir. 1935).

In perhaps the most frequently quoted expression of the doctrine, in Graver Tank & Manufacturing Co. v. Linde Air Products Co., 339 U. S. 605, 70 S. Ct. 854, 94 L. Ed. 1097 (1950), the Supreme Court stated:

> "In determining whether an accused device or composition infringes a valid patent, resort must be had in the first instance to the words of the claim. If accused matter falls clearly within the claim, infringement is made out and that is the end of it.
>
> "But courts have also recognized that to permit imitation of a patented invention which does not copy every literal detail would be to convert the protection of the patent grant into a hollow and useless thing. Such a limitation would leave room for—indeed encourage—the unscrupulous copyist to make unimportant and insubstantial changes and substitutions in the patent which, though adding nothing, would be enough to take the copied matter outside the claim, and hence outside the reach of law. One who seeks to pirate an invention, like one who seeks to pirate a copyrighted book or play, may be expected to introduce minor variations to conceal and shelter the piracy. Outright and forthright duplication is a dull and very rare type of infringement.

To prohibit no other would place the inventor at the mercy of verbalism and would be subordinating substance to form.

* * * * *

"In determining equivalents, things equal to the same thing may not be equal to each other and, by the same token, things for most purposes different may sometimes be equivalents. Consideration must be given to the purpose for which an ingredient is used in a patent, the qualities it has when combined with the other ingredients, and the function which it is intended to perform. An important factor is whether persons reasonably skilled in the art would have known of the interchangeability of an ingredient not contained in the patent with one that was.

"A finding of equivalence is a determination of fact. Proof can be made in any form: through testimony of experts or others versed in the technology; by documents, including texts and treatises; and, of course, by the disclosures of the prior art.

"Like any other issue of fact, final determination requires a balancing of credibility, persuasiveness and weight of evidence. It is to be decided by the trial court and that court's decision, under general principles of appellate review, should not be disturbed unless clearly erroneous. Particularly is this so in a field where so much depends upon familiarity with specific scientific problems and principles not usually contained in the general storehouse of knowledge and experience." (Id. 607, 609-610, 70 S. Ct. 855).

Accord, Specialty Equipment & Mach. Corp. v. Zell Motor Car Co., 193 F. 2d 515, 518-520 (4th Cir. 1952);

Marvel Specialty Co. Inc. v. Bell Hosiery Mills Inc., 330 F. 2d 164, 174-177 (4 Cir. 1964), cert. denied, 379 U. S. 899, 85 S. Ct. 187, 13 L. Ed. 2d 175; and Waterproof Insulation Corp. v. Insulating Concrete Corp., 153 F. Supp. 626 (D. Md. 1957).

A device infringes where the substance of an inventor's contribution has been appropriated even if practiced

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imperfectly. Matthews v. Allen, 182 F. 2d 824, 827-828 (4th Cir. 1950); Baker Manufacturing Co. v. Whitewater Manufacturing Co., 298 F. Supp. 1389, 1397 (E. D. Wis. 1969); and Admiral Corp. v. Zenith Radio Corp., 296 F. 2d 708, 717 (10th Cir. 1961).

The combination into a single physical member of two elements called for by a patent claim does not avoid infringement if the single member performs in substantially the same way the same functions as the two, nor does the separation of one member into two, if the two perform substantially the same function as the one. Specialty Equipment & Mach. Corp. v. Zell Motor Car Co., *supra* at 518; Skelton v. Baldwin Tool Works, 58 F. 2d 221, 227 (4th Cir. 1935); Royal Typewriter Co. v. Remington Rand, 168 F. 2d 691, 693 (2nd Cir. 1948), cert. denied, 335 U. S. 825, 69 S. Ct. 50, 93 L. Ed. 379; Borg-Warner Corp. v. Mall Tool Co., 217 F. 2d 850, 853 (7th Cir. 1954), cert. denied 349 U. S. 946, 75 S. Ct. 875, 99 L. Ed. 1272; and Zysset v. Popeil Brothers Inc., 276 F. 2d 354 (7th Cir. 1960), cert. denied, 364 U. S. 826, 81 S. Ct. 62, 5 L. Ed. 2d 54.

2. Sun's 30-ton gear.

In addition to the variations from '390 with respect to Sun's 80-ton gear, mentioned above and found not to

avoid equivalence, Sun's 30-ton gear has another, and very significant, difference.

Each of the claims of '390 in suit calls for a, or a pair of, purchase block fittings, each fitting adapted to have an upper and a lower purchase block and associated purchase tackle suspended from it. Sun's 30-ton tackle (PX 63) has no upper purchase blocks. Plaintiff argues that the "function" of the upper cargo blocks is served by the cross-over sheave and the guide sheaves. Defendant counters, with far greater persuasiveness, that the cross-over and guide sheaves do not perform the function of the omitted purchase block(s) called for by the claims. The cross-over and guide sheaves provide for four parts (of wire) running to the lower purchase blocks of the 30-ton rig. The parties are in agreement that this gives a mechanical advantage of 4:1. This is insufficient for the heavy loads for which the Sprengel gear is designed; the upper purchase block(s) add additional parts in the tackle leading to the lower purchase blocks, and hence an increase of mechanical advantage.

Plaintiff does not argue that sheaves can simply be added to the guide blocks and/or the equalizing sheave of the 30-ton gear.

Defendant's 30-ton rig without upper purchase blocks is not the equivalent of the rig of '390, and cannot perform the heavy lift function of the '390 rig.

II. *Defendant's Knowledge or Information as to Sprengel Design.*

As submitted for bids in early 1963, the specifications for the Santa Lucia class ships called for heavy lift gear of the Stulcken fork-type.[89] Sun was the low bidder, and

89. Menko, PX 125, pp. 28-31; PX 132, par. 1.

as early as June 1963, Sun indicated its desire to substitute some other gear.[90]

Sun proposed the substitution of Wiley-Lehmann gear in March 1964, but Grace rejected it for "operational and technical reasons" (PX 137A-C).

On June 25, 1964, Sperg first made a sketch for Sun of his proposed design for heavy lift gear (PX 92) which did not have a cross-over sheave (Tr. 1792 ff). On July 27, 1964 Sperg prepared a drawing of his proposed gear for Sun's patent attorney.[91] This showed gear having the upper purchase block sheaves affixed to the end of the boom, a cross-over sheave permanently affixed in a plane perpendicular to the boom's longitudinal axis, and the use of non-articulating "ears" for the shackles connecting the topping lift tackle to the end of the

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boom. These features appear in the patent drawings (PX 68) and in all of Sun's submissions to Grace and Gibbs & Cox until May 1965.

Sometime in the latter part of 1964, Captain Mohan[92] visited MacGregor's offices and inspected the single pendulum-block model,[93] conceived by Sprengel in September 1963. In September 1964 Atkinson, President of Sun, was

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90. PX 136, par. 4e.

91. PX 90E, DX 52; Sperg, Tr. 1809-12.

92. After thirty years as an officer in the United States Navy, Captain Mohan was employed by Grace in 1963 as its Assistant Technical Director, and at the end of 1964 or beginning of 1965 he became Technical Director. He "took over the responsibility for coordinating the efforts of the building of the Santa Lucia ships" (PX 124, pp. 3-10, 89).

93. PX 44A-C; Klewsaat, Tr. 1668, 1680-82; Mohan, PX 124, pp. 90-91, 135-36.

shown pictures of models embodying both the single and double pendulum block designs.[94]

Gibbs & Cox expressly rejected Sperg's design in a letter dated October 29, 1964, in which numerous alleged deficiencies were enumerated.[95]

Gibbs & Cox requested that Sun furnish design data regarding the "comparable Stulcken rig" for comparative evaluation, but Sun refused, ostensibly because it did not agree with the criticisms of Gibbs & Cox.[96]

Thereafter Sun on several occasions submitted detailed drawings for the 80-ton and 30-ton gears.[97]

As a result of the failure of Gibbs & Cox to approve any of the Sperg drawings, the March 17, 1965 conference previously described, was held at which the Sperg, Fork and new Stulcken rigs were compared (PX 69 & PX 69B).

Sperg and other Sun draftsmen were then instructed to design boom head fittings which did not have the fixed upper purchase block sheaves which had been criticized by Gibbs & Cox. (Sperg, Tr. 1980-82).

On April 22, 1965, Klewsaat and Korthaus of MacGregor exhibited to Sun personnel, including Zeien, Sun's Vice President of Engineering; Brawner, his assistant; Pavlik, Sun's Chief Naval Architect; Wilkie, Sun's Chief Draftsman of Sun's entire hull drafting department; and five others, a model of Sprengel's gear; still pictures of the single and double pendulum-block type gear, and motion pictures of the M. S. Westphalia; and the differ-

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94. PX 76F, 76G and 84; DX 80, pp. 35-42; Tr. 1669-73.

95. PX 90, pars. 3, 4, 8 and 9; PX 125, pp. 99-120.

96. PX 90, par. 11; PX 125, pp. 125, 141-6; PX 127, pp. 80-82; PX 125, pp. 140-146.

97. PX 97A, 97C; PX 98A, 98C; PX 73A-C, drawings FF and JJ, dated February 11, 1965; PX 73F.

ences between the fork-type and pendulum block gear were explained.[98]

Finally, by drawings dated May 12, 1965 and June 22, 1965,[99] Sun's detailed engineering drawings for the boom and boom head fittings for the 80-ton and 30-ton rigs were established in form actually installed on Grace's Santa Lucia line ships.

Sun's efforts to use gear other than the specified Stulcken fork; Sun's unsuccessful efforts to have the gear shown in the Sperg patent approved; and the modification to a pendulum type gear after exposure to Sprengel's development, all lead to the conclusion, which the Court draws, that the 80-ton gear in fact installed was based upon knowledge of the Sprengel pendulum gear structures.

III. *Sun and Grace's Appraisal of the Sprengel Gear and the Accused Gear.*

1. Pechtel, employed by Sun as a Naval Architect, prepared Sun's instruction manual (PX 150) for the operation

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of the heavy lift gear installed on Grace's Santa Lucia Line ships. In this manual (PX 150, January 1966) he copied extensively, pictorially and textually (but without quotation marks or acknowledgment) from the text of and illustrations in plaintiff's brochure (PX 23) entitled "The Stulcken Mast—Over a Deckade of Progress." He admitted using PX 23. (PX 129, p. 9). He characterized

98. PX 44A-C; PX 76A-H; PX 77A-G; PX 42; PX 87; Tr. 1682-86, 2714; PX 130, p. 25; DX 80, pp. 42-48.

99. PX 55 and PX 57. Remarkably, they are also known as drawings FF and JJ, although they bear no resemblance to the similarly lettered drawings forwarded by Sun on February 11, 1965.

Sun's gear as having "one pendulum block fitting . . . on each side of the boom head". (PX 150, p. 7).

There could be no clearer form of recognition that the Sprengel and the Sun 80-ton rigs "perform substantially the same function in substantially the same way to obtain the same result." (Sanitary Refrigeration Co. v. Winters, 280 U. S. 30, 42, 50 S. Ct. 9, 13, 74 L. Ed. 147 (1929)).

2. On December 2, 1965, Captain Mohan wrote to Grace's President, in part as follows:

> "On page 7 [of PX 23] is a Stulcken type almost exactly like ours. In some case[s] the Stulcken has one cargo block offset on the boom to permit swinging through without splitting the block. This requires a boom which is stiffened to make up for the torque introduced by the offset block. Stulcken has standardized on a split block—just like ours. *Sun fears a law suit* by Stulcken *since both systems are practically identical. I think Sun got there first*". (PX 131; emphasis added)

Defendant seeks to weaken this damaging admission that the Stulcken and Sun "systems are practically identical" by suggesting:[100]

(a) That Captain Mohan, although Technical Director with "the responsibility for coordinating the efforts of the building of the Santa Lucia ships" (PX 124, p. 89) was not "knowledgable".

No repudiation is of record by Grace of either the propriety of the comparison, or of Captain Mohan's capacity.

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100. Defendant's Brief on Infringement, p. 55.

(b) That Captain Mohan was comparing the Sperg patent apparatus with that of Sprengel.

It is incredible that Captain Mohan did not know in December of 1965, that the Sperg patent apparatus was not being installed, and was not going to be installed on the Grace lines ships, in view of its repeated non-acceptance by Gibbs & Cox, and the filing on May 12, 1965, of the superseding plans for the gear actually installed (PX 55, also known as GG).

We thus have unqualified recognition, both by Grace and Sun, of the similarity, even the practical identity, of the two rigs.

CONCLUSION

1. The Court has jurisdiction of the subject matter of this suit, and over the parties.

2. The patent in suit, No. 3,236,390, and claims 1, 2, 3, 14, 15 and 18 thereof are valid.

3. The 80-ton gear installed on the Grace Line Santa Lucia class ships infringes claims 14, 15 and 18 of Patent 3,236,390.

4. The 30-ton gear installed on the Grace Line Santa Lucia class ships does not infringe any of the claims in suit.

5. Plaintiff is not barred from enforcing the patent by misuse of the patent, or of plaintiff's patent position.[101]

101. Defendant has raised a unique, even weird, defense of estoppel, apparently on the ground that plaintiff should have amended its patent application before issuance, or applied for a reissue, to insert claims that would read verbatim on the accused structures. No authority is cited to support this contention, and the Court is aware of none. Moreover, until the ships were delivered, plaintiff could not be certain of exactly what the gear would be; and some changes were made in the gear after installation (PX 124, p. 178).

6. Defendant's counterclaims are dismissed.

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7. If the parties are unable to agree upon damages, they are to be assessed through further proceedings.

The foregoing represents the Court's findings of fact and conclusions of law, under F. R. Civ. P. 52(a).

An appropriate decree may be submitted within fifteen days.